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Skeptical Inquirer

THE MAGAZINE FOR SCIENCE AND REASON

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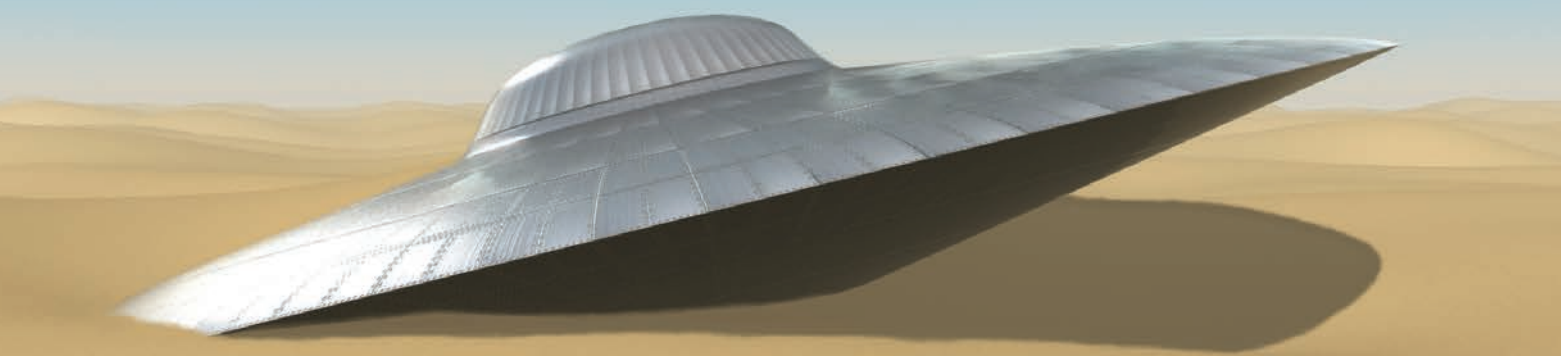
HOW SOME UFO MYTHS DEVELOP



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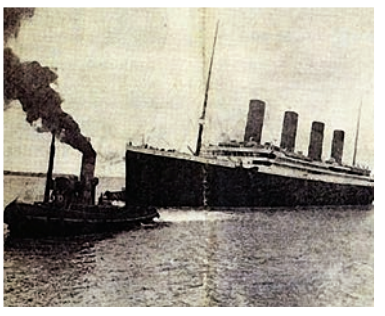

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The Roswell Syndrome . . . and Pseudoskepticism

The bread and butter of skeptical investigation is the critical analysis of specific claims. Take some dramatic popular claim and subject it to all the tools of skeptical analysis. Dissect it, examine it, test it. Drill down narrowly and deeply to see if there's any substance. More often than not, the outcome is notably different from what had been claimed. We do that all the time.

Sometimes, however, it is good to step back a bit and look at the larger picture. Look for patterns and try to elucidate some general lessons or principles that can be a useful guide to our broader understanding. We also do that a lot in these pages.

We have two such articles in this issue: Joe Nickell and James McGaha's "The Roswellian Syndrome" and Lawrence Torcello's "The Trouble with Pseudoskepticism."

Nickell is a master of investigating specific claims, but here he teams with astronomer and retired Air Force pilot McGaha to take a broader look at the prototypical "crashed saucer" claim of our time, the notorious Roswell incident, to show how this and other prominent UFO myths develop. Roswell has now been thoroughly debunked to the satisfaction of most critical-minded people, but it is still believed and beloved by UFO enthusiasts, filmmakers, local tourist bureaus, and mythmakers everywhere.

Looking at what happened at Roswell, Nickell and McGaha (very usefully, I think) identify a process they call the "Roswellian Syndrome." Something triggers a UFO report (often something real, if not as dramatic as perceived), then it is debunked, then it goes underground. We think it's forgotten, but it isn't. Then begins an intricate mythmaking process, and the (now much more elaborate) story reemerges as a conspiracy tale with more mythologizing and growing media hype. (From my editorial perch here in Albuquerque, I witnessed this process unfold over the past third of a century with Roswell.) Nickell and McGaha take us through this process, briefly describing the original incident, the original debunking, the story's submergence, the subsequent mythologizing, and then the tale's reemergence with the aid of mystery-mongering book authors and an often nearly out-of-control media bandwagon effect.

The Roswellian Syndrome can be seen playing out again and again in other key UFO cases. Nickell and McGaha apply it to the Flatwoods, Kecksburg, and Rendlesham Forest cases, also favorites of UFO enthusiasts. The processes of mythmaking, folkore, and fakelore are all readily apparent. They suggest that they have identified a genuine pattern, and they hope by doing so to promote more critical thinking regarding these and other sensationalized cases.

In his article, Torcello, a bioethicist and philosopher at Rochester Institute of Technology, takes a philosophical look at both scientific and unscientific thinking. He notes that skeptical rigor is inherent in good science, and he reapplies an older term, *pseudoskepticism*, to the rejection of assertions already firmly established through the rigorous scientific process; nonexperts make a show of openly contradicting well-established scientific conclusions. Pseudoskepticism describes much of what we see in public discourse about some scientific matters—from modern medicine to climate change—that certain groups find objectionable. Identifying it as such is a start in distinguishing the real science from the bogus.

—Kendrick Frazier

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Hot Dispute on Healing Claims: 'Persecution' That Isn't

Hayley Stevens

I first saw the Healing on the Streets (HOTS) team on my way to a meeting through the city center of Bath in Somerset, United Kingdom. I'd never encountered the group before, and at first I thought they might be psychic healers. Out of curiosity, I took one of the leaflets that were on display in a holder nearby. It's a habit. Ever since battling a life-threatening illness in my teens, I've been very aware of people making unsubstantiated claims about treating and healing health conditions. I've been the vulnerable person who was tempted into such treatments. I pick up leaflets, take business cards, and cut adverts out of magazines and newspapers on a regular basis if I think the claims being made are spurious.

It turns out it wasn't a group of psychic healers but Christians from local churches who wanted to pray for the healing of strangers on the street. Their intentions seemed good, but it was the wording on the leaflet that set alarm bells ringing. The group claimed that healing triggered by prayer could cure conditions from multiple sclerosis, addiction, and cancer to asthma, arthritis, and paralysis. My gut reaction was that I should submit a complaint to the Advertising Standards Authority (ASA), an independent advertising regulatory body in the United Kingdom, to see if they agreed that the ad was in breach of Committee of Advertising Practice (CAP) codes.

The ASA upheld my complaint and also expressed strong concern that the ads might discourage people from seeking essential treatment for conditions for which medical supervision should be sought. As a result, the ASA summarized, "The ads must not appear again in their current form. We told HOTS not to make claims which stated or implied that, by receiving prayer from their volunteers, people could be healed of medical conditions. We also told them not to refer in their ads to medical conditions for which medical supervision should be sought."

Healing on the Streets responded by claiming that they were being persecuted "by a group generally opposed to Christianity." They also claimed that the ASA's ruling was telling them to recant their faith. This wasn't the case, and this claim made me decide to come forward and explain in a post on my personal blog that I was the complainant and that I didn't make the complaint because they were Christian but because of the specific claims they were making.

Ever since battling a life-threatening illness in my teens, I've been very aware of people making unsubstantiated claims about treating and healing health conditions.

The *Bath Chronicle*, whose editor read my blog post and thought it was newsworthy, was the first to publish the story, which was then picked up by a news syndicate. The first I knew of this was when a local journalist told me that it was likely the story was going to "go national" and that I might "end up in the *Daily Mail* as the bad guy in this." He was right. I did end up as the bad guy: I became "atheist Hayley Stevens" who used ASA as a weapon to persecute and censor Christians.

I ended up on the local news twice, defending my complaint to the ASA and explaining that I wasn't persecuting anybody but was simply challenging claims made about specific illnesses that didn't appear to be evidence based. There were polarizing reactions to the story. Many people who didn't agree with the outcome of the ASA complaint shouted about religious freedom and censorship. However, the protests against the ASA adjudication seemed to miss the point. The ruling had nothing to do with religion but was actually about specific medical claims. Nobody should be exempt from being required

The Healing on the Streets group claims to be able to heal complaints ranging from arthritis to cancer through the "power" of prayer.

to provide evidence to back up their claims, religion-based or not. As I replied to one of my harsher online critics, it is fine to pray for the ill to recover if that is how you choose to cope; just don't tell strangers on the street their cancer might be healed that way. That steps over a line, and I refuse to stay quiet about it.

After one of my appearances on the local news, somebody made a complaint to my employers in what I believe was a malicious attempt to terminate my employment. All that I know is that they were from the local church ward and asked my employers what they were doing "employing someone like that." My boss reprimanded me that day for being "irresponsible," a charge I believe is unfair, but luckily I didn't lose my job and wasn't officially disciplined in any way. I was advised by my employer not to write anything more about the ASA complaint and told not to do any more media appearances. However, I'm writing about my experience here because fighting for freedom of expression is a more important job.

The day after one of my local news appearances, a stranger recognized me in a shop because of the coat I had been wearing. He told me how he and his wife had been desperate for an answer before she died of lung cancer a few years ago. He said, "It's good that we have people like you who stand up for those who can't stand up for themselves." Those words will stay with me for a long time.

I think my story demonstrates one very important thing: standing up for what we know is right and speaking out against what we know is wrong *can* result in a tangible achievement. One person can make a difference; all you have to do is act. Be that person. Make that difference.

Hayley Stevens is a skeptical podcaster, writer, and public speaker. She is the founder of Project Barnum, an educational resource about psychic trickery, and also hosts the popular *Righteous Indignation* podcast. Being a reformed ghost hunter, she can often be found trying to educate people about the pseudoscience involved in the majority of ghost and monster research.

Doubtful News Blog Launched

Benjamin Radford

The blog *Doubtful News*, whose slogan is "Paranormal and pseudoscience news . . . because people really believe this stuff," was recently launched. The *Doubtful News* feed provides links to original sources of Internet news stories about a wide variety of topics related to science, pseudoscience, and skepticism, including anti-vaccination, astrology, cryptozoology, UFOs, mass hysteria, ghosts, crop circles, hoaxes, psychics, superstition, and much more. Posts are primarily written with a skeptical bent, providing brief commentary and some background while encouraging readers to seek out the source and inquire for themselves.

Sharon Hill, comanager of the blog with Torkel Ødegård, explained:

> The blog came about because there was no one-stop source of breaking news of interest to critical thinkers that was not primarily straight science offerings or opinions. *Doubtful News* delivers the fringe news that may not get attention right away. The theme woven through the stories is that critical thinking is essential for understanding what is going on in the world. The format, with multiple updates daily, allows for stories to be posted days ahead of their appearance in larger outlets, the skeptical literature and even before appearance in blogs and podcasts.

Access is available via the website doubtfulnews.com, Twitter @doubtfulnews, and Facebook www.facebook.com/doubtfulnews.

CSI Helps Expose Woolly Mammoth Video Hoax

Benjamin Radford

According to a story in the *Sun* tabloid newspaper, a video surfaced that seems to show a live woolly mammoth—an animal that scientists say has been extinct for about four millennia. The "jaw-dropping" footage, which shows a dark, blurry creature crossing a river, was allegedly "caught by a government-employed engineer last summer in the Chukotka Autonomous Okrug region of Siberia."

The video was an Internet sensation and made headlines around the world in early February 2012. Some Bigfoot believers and Loch Ness monster lovers murmured their tentative approval, hoping it proved that large unknown (or assumed extinct) animals still exist in Earth's remote wilds.

Discussions popped up all over the web, including on the *Doubtful News* blog and the Facebook page of the *MonsterTalk* podcast. While most people didn't necessarily believe that the blurry figure in the video was really a woolly mammoth as claimed, viewers were sharply divided about what, exactly, it was. Some suspected the video was an outright hoax—a computer-generated elephant or mammoth digitally inserted into a real river scene. Many others, however, were convinced that the animal was real: not a mammoth but instead a bear with a large fish in its mouth crossing a stream.

I investigated the video at the request of LiveScience.com and noted several suspicious aspects, including its brevity and the fact that the man who posted the piece, a paranormal enthusiast named Michael Cohen, has been involved with several other videos of questionable authenticity (if not outright hoaxes). I also consulted Hollywood visual effects artist Derek Serra, who concluded among other things that the video image "appears to have been intentionally blurred."

Several days after I posted my analysis of the video, I got an email from a man named Ludovic Petho, who directed me to

Mammoth or bear? Some claim the blurry subject of this video still is a woolly mammoth. Others see a more pedestrian bear.

footage he filmed at the Kitoy River in Siberia's Sayan Mountains in the summer of 2011. Petho filmed the river scene during a ten-day solo hike in the mountains as part of a video project about his grandfather's escape from a Siberian POW camp in 1915. The footage was identical to the woolly mammoth video with one glaring difference: "I don't recall seeing a mammoth; there were bears, deer, and sable," he told me, "but no woolly mammoths. I had no idea my footage was used to make this fake sighting."

Petho noted that his original video had been available on YouTube since July 2011. I then wrote a follow-up piece exposing the hoax, which appeared on CBS News, MSNBC, *The Christian Science Monitor*, and elsewhere. Lee Speigel of the *Huffington Post* wrote an excellent piece on the hoax as well, focusing more on how the hoaxers got Petho's footage; Petho is in the process of seeking legal recourse for copyright violation. ■

Evolution Advocate Asa Gray Featured on American Scientists Stamp Series

Botanist and evolutionary scientist Asa Gray, a contemporary and supporter of Darwin, is one of four scientists honored on commemorative postage stamps in the third American Scientists issuance of the U.S. Postal Service.

Gray, a professor of natural history at Harvard for thirty-one years, met Darwin in 1851 and later boldly supported Darwinism in America against objections of religious leaders and others. Gray served as president of the American Association for the Advancement of Science from 1863 to 1873.

Chemist Melvin Calvin, physicist Maria Goeppert Mayer, and biochemist Severo Ochoa are the other three scientists honored on the 2011 "Forever" first-class stamps. Each stamp shows a collage featuring a photograph and a signature of the scientist along with equations, diagrams, or letters associated with his or her research.

"With these stamps," said a Postal Service statement, "the Postal Service honors four Americans who, while dedicating their lives to understanding the fundamental processes of nature, made extraordinary contributions to the advancement of science." The previous American Scientists issuances (four each) were in 2008 (SI, July/August 2008) and 2005 (July/August 2005).

Here are the 2011 stamps and the short bios printed on the reverse side of sheets of twenty.

Melvin Calvin (1911–1997) was the first scientist to trace in detail the process of photosynthesis and conducted pioneering research on using plants as an alternative energy source. He won the Nobel Prize in Chemistry in 1961.

Asa Gray (1810–1888), one of the first professional botanists in the United States, advanced the specialized field of plant geography and became the principal American advocate of evolutionary theory in the mid-nineteenth century.

Maria Goeppert Mayer (1906–1972) developed a theoretical model that helped explain the structure of the atomic nucleus; for this work she became the only woman other than Marie Curie to win a Nobel Prize in Physics.

Severo Ochoa (1905–1993), a biochemist, was the first scientist to synthesize ribonucleic acid (RNA) and competed in the race to decipher the genetic code. Ochoa won the Nobel Prize in Physiology or Medicine in 1959.

A Feeble Challenge to Evolution from 'Reasons to Believe'

Biblical creationism purports to be a legitimate alternative to evolution. This report outlines numerous problems with one Christian ministry's creationism curriculum.

BRIAN BOLTON

During the past six months I attended a multipart audio-visual program at the Georgetown Palace Theater in Texas promoting biblical creationism as an alternative to neo-Darwinian evolution. The program, sponsored by the Main Street Baptist Church, consisted of a series of thirteen one-hour presentations delivered every other Sunday morning. The curriculum was developed by a fundamentalist Christian ministry located in California (with an Austin chapter) called "Reasons to Believe" (RTB). A Christian apologist trained to deliver the RTB curriculum presented the course, and the syllabus was composed of chapter-by-chapter critiques of the arguments and evidence summarized in prominent evolutionary biologist Richard Dawkins's book *The Greatest Show on Earth.*

There are many problems with the assumptions, rationale, and logic of the RTB curriculum.

Supernaturalism and Circularity

RTB promulgates a comprehensive agenda of Christian apologetics that rejects all other belief systems and sacred texts. The RTB theology is premised on two primary faith-based doctrines considered true beyond all doubt and immune from all criticism: the God of the Bible is the only authentic deity, and the Bible is his perfect word.

It follows that RTB embraces supernaturalism as a valid mode of explanation of observed phenomena. Specifically, the Bible "describes reality beyond the natural world," and it possesses "supernatural accuracy." In plain language, God is responsible for everything. This position contradicts that of the entire scientific community, which accepts only natural causal mechanisms.

RTB cannot be regarded as a legitimate scholarly endeavor, because it begins by asserting that the truth is known before any investigation is ever carried out. RTB does not propose hypotheses derived from the Genesis creation stories that can be tested and which are subject to empirical disconfirmation. The divine creation explanation cannot be refuted because it is assumed to be true a priori as an article of faith—a textbook example of circular reasoning.

Atheism and Materialism

The brochure that announced the RTB program and briefly described some features of the curriculum suggested an association between evolution and the philosophy of atheism. Specifically, a reference to "neo-Darwinian evolution as espoused by famed atheist Richard Dawkins" and the assertion that "Richard Dawkins is the face of atheism today" imply this connection, which is repeated throughout the program. In fact, evolution is not an atheistic doctrine.

The strongest argument against this unwarranted insinuation is that the vast majority of people who endorse evolution are religious believers. They are called "theistic evolutionists," typically devout Christians—Catholics, Methodists, Episcopalians, Lutherans—but persons of other faiths as well who accept the scientific validity of evolution and regard the Genesis stories as possessing only poetic or metaphoric truth.

A related epithet creationist opponents invoke to stigmatize evolution is that it is "materialistic," meaning that spiritual factors are excluded from consideration. All scholarly disciplines are predicated on the assumption of philosophical naturalism, which holds that nonnatural explanations are beyond the realm of empirical investigation.

Inerrancy and Faith

The foundational postulate of RTB theology is that the Bible is God's word and is therefore without error. Rephrased, the Bible is absolutely accurate and truthful in every statement. This assumption is rejected by most Christian and Jewish denominations.

The Bible contains hundreds of erroneous assertions and contradictory statements, which have been catalogued in numerous books. Furthermore, the well-

known stories, including the Genesis creations, the Noachian deluge, the Mosaic Decalogue, and the life of Jesus, were all adapted from earlier pagan folktales and legends. Also, the inerrantists cannot agree among themselves, with young-Earth advocates promoting a literal six-day creation and old-Earth proponents conforming their beliefs to the geological time scale.

The doctrine of inerrancy is accepted by adherents on the basis of faith, which entails a commitment or allegiance that reflects personal conviction alone. Because faith operates in the absence of evidence, or may even contradict evidence, it is by definition not a rational process. Hence, RTB's self-descriptors, "scientific," "rational," "educated," and "thoughtful," are hardly warranted.

Spurious Strategies

The RTB program is predicated on the fallacies of false equivalence and arguing from ignorance. The curriculum's criticisms of evolution are organized around the thirteen chapters in Dawkins's book. The underlying strategy assumes that identifying problems with evolution will enhance the case for biblical creationism. This premise violates two basic logical principles.

First, evolution and biblical creationism do not constitute "two sides of a debate." Evolution is a scientific fact that is supported by a monumental corpus of evidence generated by fifty disciplinary specialties, whereas Genesis creationism consists of two stories that total about 1,400 words and were adapted from two distinct Sumerian-Babylonian creation myths. Counterpoising evolution against creationism entails a false equivalence, specifically that of equating and comparing evidence-based science with Bible-based mythology. To suggest that creationism is a legitimate theory is a woeful misuse of language.

Second, the RTB presumption that specifying difficulties in some lines of evidence will weaken the multidisciplinary argument for evolution and thereby establish support for Genesis creationism commits the fallacy of arguing from ignorance. This tactic would be valid only if there were just two acknowledged alternative explanations, only one of which was true. Neither of these requirements of alternative and disjunctive syllogisms is satisfied by the creationists.

Creationist Confusion

Biblical creationism is one of many religious creation myths that are sincerely believed by their adherents, including those from which the two Genesis stories were derived. Furthermore, the biblical creationists do not even agree among themselves, arguing for two very different time translations that differ by a factor or multiple of almost one million. In actuality, there are numerous creation stories, such as those of the

"It is error only, and not truth, that shrinks from inquiry."
– Thomas Paine

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Australian Aborigines and the native peoples of the Americas, as well as Islamic, Hindu, and Confucian conceptions.

Moreover, the stipulation that only one of the two alternative explanations can be true is violated by the position adopted by those Christians and Jews who are labeled theistic or God-directed evolutionists. These believers subscribe to the view that God implemented evolution as the process by which all life-forms developed over time, including humankind. Clearly, this position accepts evolution as thoroughly compatible with the Bible, finding different truths in each.

By devoting their energies to an ongoing attack on evolution, the proponents of biblical creationism also deflect attention from the major defect in their unrelenting mission of political advocacy. This is of course the complete lack of empirical evidence supporting their belief in the literal truth of the Genesis creation stories. Moreover, RTB now unbelievably asserts that "the appearance of design shifts the burden of proof to evolutionists." How ludicrous given that evolutionists have generated all of the evidence while creationists have not presented one iota of experimental evidence in support of their folktales.

Human Evolution

The critical issue for creationists is their belief that God created man and woman as adults 100,000 years ago exactly as described in the Bible. They reject the overwhelming evidence that modern humans evolved from apelike ancestors over a span of several million years. Creationists deny that our closest living cousins are chimpanzees, gorillas, and orangutans.

What explanation of human origins is favored by Bible creationists? They invoke their doctrine of "special creation" of humans, presented in three brief formulations in the two Genesis creation stories:

1. God created man and woman in his own image (Gen. 1:27).
2. God formed man from the dust of the ground and breathed life into him (Gen. 2:7).
3. God removed a rib from the man and made a woman (Gen. 2:21–22).

Do these declarations constitute a "rational creationist belief"? Have the RTB scholars provided the "irrefutable, empirical, evidence" that they demand of evolution proponents to support their Godly image/dust of the ground/woman from man's rib "theory" of human origins? No, they have not done so. In their view they don't have to conduct research because their postulation of scriptural inerrancy guarantees that the Genesis verses are historically and biologically accurate. Of course, we know that humans are not exempt from the laws of nature, regardless of what the Bible says.

Undisclosed Information

The RTB program is a carefully selected presentation of information and arguments designed to dispute the evidence supporting human evolution out of the erroneous belief that the case for Genesis creationism will be therefore enhanced. Creationists have battled to have their views included in public school science classrooms for the past forty years with virtually no success, despite reformulations as "scientific creationism" and "intelligent design."

Three factual conclusions not acknowledged by RTB put the creationist endeavor in concrete perspective. First, every scientific organization in the world rejects creationist claims. Second, mainstream Christian and Jewish denominations reject biblical inerrancy and endorse human evolution. Third, eight U.S. Supreme Court, Federal Appeals Court, and Federal Court decisions have ruled that creationism cannot be taught in public school science classes because it is a religious doctrine.

Finally, the relentless effort of biblical creationism advocates to adduce reasons and assemble arguments to buttress their views demonstrates that they do not possess authentic faith. True faith does not require any justification, because faith *is* the unquestioning justification for all doctrinal beliefs. If there were reasons or evidence that supported Genesis creationism, then faith would not be necessary because creationism would be a valid scientific theory. The creationists' dogged search for reasons to believe betrays their claims of faith. ■

If there were reasons or evidence that supported Genesis creationism, then faith would not be necessary. . . . The creationists' dogged search for reasons to believe betrays their claims of faith.

Brian Bolton is a retired psychologist living in Georgetown, Texas.

Famous Alien Abduction in Pascagoula: Reinvestigating a Cold Case

Among reports of extraterrestrial encounters, the 1973 claim of two Mississippi men to have been taken aboard a flying saucer remains controversial. Was it a real encounter or a hoax? Or is that a false dichotomy?

JOE NICKELL

Charles Hickson, the chief claimant in the Pascagoula, Mississippi, UFO abduction case, died of a heart attack on September 9, 2011, at the age of eighty. Until his death he maintained the truth of his alien encounter—part of the UFO "flap" of 1973 (Peebles 1995, 241–45). It has remained (after the Betty and Barney Hill case of 1961) "the second most famous UFO-abduction case in history," according to UFO historian Jerome Clark (1998, 714).

Very Close Encounter

Hickson, then forty-two, was fishing from an old pier on the Pascagoula River with a friend, nineteen-year-old Calvin Parker Jr., on the night of October 11, 1973. Hickson claimed they heard a "zipping" sound and encountered a glowing object—an elongated UFO—hovering above the ground. Three robotlike aliens exited from the craft; although they were gray humanoids just over five feet tall, they were otherwise of a type not reported before or since (Nickell 2011): each entity lacked a neck, exhibited only slits for eyes and mouth, had a nose and ears that were sharply pointed protrusions, and possessed clawed hands. The legs were joined, pedestal-like, and the entity glided (see Figure 1).

The two men claimed they were taken aboard the spacecraft, where they were examined, after which they were returned to their fishing site. Unnerved, they sat in a car to regain their composure (with Hickson, at least, drinking whiskey), then reported their experience to the sheriff.

Although the UFO reported by the men had apparently not been seen by people on the heavily traveled nearby highway (Randle 2001), there had been other UFO sightings in the area, including on the night in question. The UFOs were variously described—some saw a helicopter-like object; one person reported a supposed "experiment" from an Air Force base; and so on (Clark 1998, 715; Blum with Blum 1974, 14–19).

Controversy

The pair's veracity was accepted by UFO believers J. Allen Hynek of the Center for UFO Studies (CUFOS) and James Harder of the Aerial Phenomena Research Organization (APRO), both of whom rushed to interview the "abductees." Harder tried unsuccessfully to hypnotize the men (Clark 1998, 717) but did conclude they had experienced "an extraterrestrial phenomena [*sic*]."[1] Hynek believed the pair had at least had "a very real, frightening experience" (Blum with Blum 1974, 24–25). The sheriff's department also felt the men were telling the truth, and Hickson requested and passed a lie-detector test arranged by the agent with whom the men had signed a contract to promote their story. Parker suffered a breakdown and was briefly hospitalized (Clark 1998, 714–17).

The men's fantastic report drew much skepticism. Famed UFO skeptic Philip J. Klass noted discrepancies in Hickson's account (for instance, once referring to the creatures as having a "hole" for a mouth but later calling it a "slit"). Klass also pointed out that the lie-detector test was conducted by an "inexperienced" polygraph operator and that Hickson refused to take another administered by an expert police examiner. Based on other evidence—including the fact that Hickson had once been fired for improperly obtaining money from employees under his su-

pervision—Klass concluded the case was a hoax ([1974] 1976, 347–69; 1989, 18–19).

A Solution

So which was it: a genuine alien abduction or a hoax? Or is that a false dichotomy? In reviewing the case, I thought there might be another possibility: the two men, who might have been drinking before the incident (as Hickson admitted he was after), might have dozed off. Hickson could then have entered a hypnagogic ("waking dream") state, a trancelike condition between waking and sleeping in which some people experience hallucinations, often with bizarre imagery, including strange beings (aliens, ghosts, etc.). This state may be accompanied by what is called "sleep paralysis" (the body's inability to move due to still being in the sleep mode). In fact, Hickson not only reported the bizarre imagery but also said that the aliens "paralyzed" him before carrying him aboard the UFO in what sounds like a hypnagogic fantasy.

The imagery might even have been triggered by Hickson actually sighting something—almost anything—that, while he was in the waking-dream state, appeared to be a "UFO." During a recorded interview with Sheriff Fred Diamond (Blum with Blum 1974, 30–36), Hickson described the UFO as "a blue light," adding: "It circled a bit." He emphasized it was blue, saying, "And you think you *dreamin*' about something like that, you know" (original emphasis). Hickson also reported that it made "a little buzzin' sound—*nnnnnnnnnn*, *nnnnnnnnn*" (Blum with Blum 1974, 31). Bright lights and odd noises can also be part of the waking-dream

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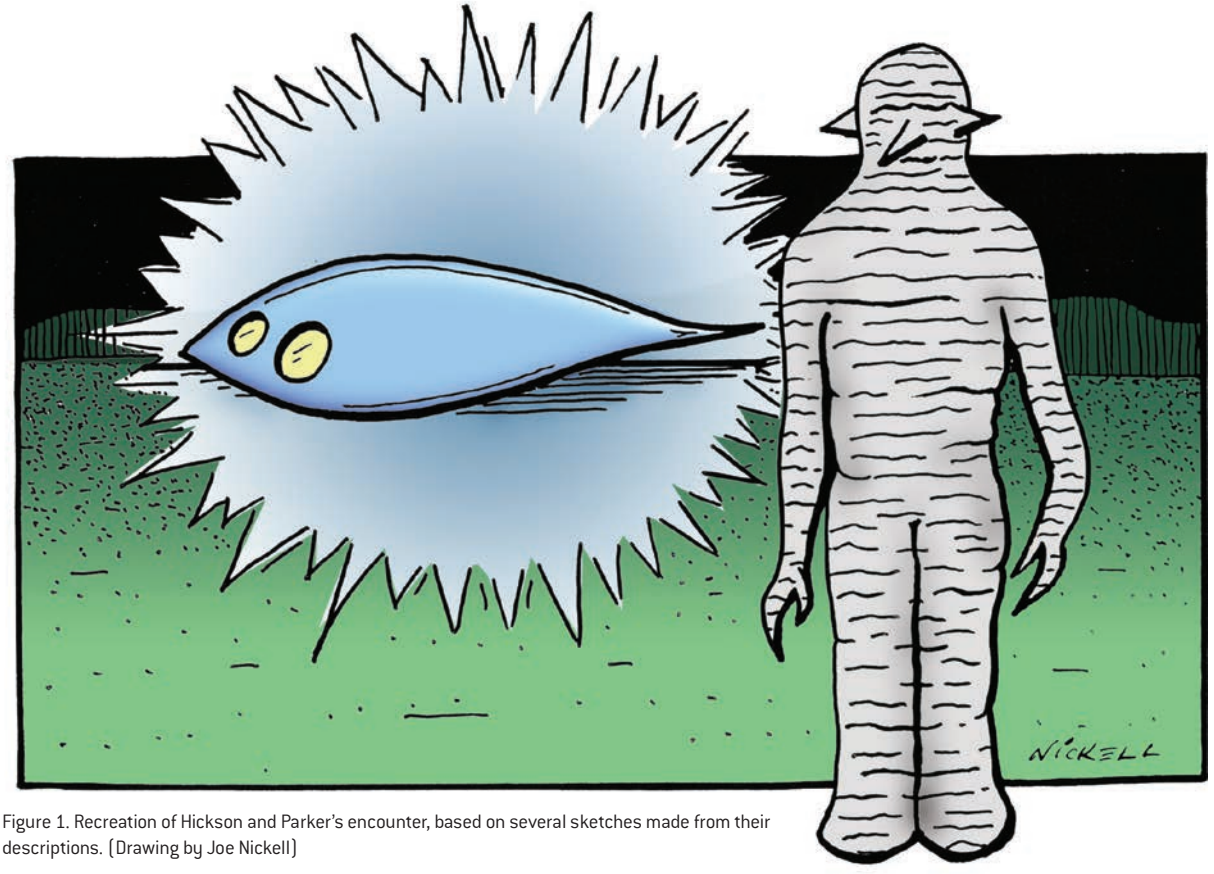

Figure 1. Recreation of Hickson and Parker's encounter, based on several sketches made from their descriptions. (Drawing by Joe Nickell)

experience, as can the sense of floating (Mavromatis 1987, 148). Hickson stated, "I couldn't resist [the extraterrestrials], I just floated—felt no sensation, no pain" (Blum with Blum 1974, 32). These phenomena, coupled with the paralysis and fantastic imagery, corroborate the diagnosis of a hypnagogic experience.

Of additional corroborative value are other factors, including Hickson's description of the aliens as speaking inside his head (Clark 1998, 715), because a feature of hypnagogia is the sense of perceiving "with whole consciousness." This explains the bright lights and clarity of his experiences, since hypnagogic visions often seem particularly illuminated, vivid, and detailed (Mavromatis 1987, 14–52, 148).

But if Hickson had a hypnagogic experience, what about Parker? Actually, he need not have been in such a state himself because, as he told officers, he had *passed out* at the beginning of the incident and failed to regain consciousness until it was over (United Press International 1973). Later he "remembered" bits and pieces of the alleged encounter. This would be consistent with an example of *folie à deux* (a French expression, the "folly of two") in which a percipient convinces another of some alleged occurrence (as by the power of suggestion, the force of a dominant personality, or the like) or the other person simply acquiesces for whatever reason. (Young Parker's position was vulnerable: he had recently joined the shipyard where Hickson worked and was residing with the Hicksons.) It would have been significant if Parker had himself been in a hypnagogic state, since "suggestibility is high during this state" (Goldenson 1970, I: 574). Interestingly, when the two men were left alone in a room at the sheriff's office, where they were secretly tape recorded (Clark 1998, 716), they did not make incriminating statements as they might have if perpetrating a hoax but acted more like people comparing notes to see if they were in agreement with each other.

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Still, some of Hickson's behavior is questionable. For example, he kept adding to his story. He claimed on a television show a month later that the interior lights of the UFO had been so intense as to cause eye injury lasting for three days, although an extensive hospital examination the day after the incident had shown no such eye damage (Klass 1974, 349–50). But this is a familiar story: even accounts of the truest occurrences gain distortions and embellishments over time, so why should Hickson's story be any different? UFOlogist Kevin D. Randle (2001) insists Hickson's alterations "went beyond that." Specifically, he says, "These changes seemed to be in response to criticisms and appeared to be an attempt to smooth out rough spots in the story." But to me that just signals Hickson's defensiveness brought on by people ridiculing him—not proof of initial hoaxing.

When all the facts are weighed, the preponderance of evidence appears not only to favor the hypothesis involving the hypnagogic state but to provide corroboration as well. The realization may not benefit the late Charles Hickson, but it could help others who hear of supposed alien abductions to rest in peace.

Acknowledgments

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Note

1. The men were later hypnotized by another person (Hickson and Mendez 1983).

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Joe Nickell is CSI's senior research fellow. His doctorial dissertation (1987) was titled "Literary Investigation." His website is www.joenickell.com.

Ghost Author? The Channeling of 'Patience Worth'

Pearl Lenore (Pollard) Curran (1883–1937) (Figure 1), wife of John H. Curran of St. Louis, began in 1913 to receive poems and novels, via Ouija board, from a seventeenth-century Puritan English woman named "Patience Worth." Patience had supposedly been born in England in 1649 and immigrated to America, where she was slain by Indians at the age of forty-five, although no historical record has ever been found for her.

Some 216 years later, "Patience" made her debut one July evening while Curran and a friend, who was a writer, were playing with a Ouija board. With their fingers pressing on the planchette, it began to spell out a strange message:

> Many moons ago I lived. Again
> I come — Patience Worth
> my name —

The message unleashed a flow of Patience Worth writings that eventually filled whole volumes: *The Sorry Tale*, *Hope Trueblood*, and *The Pot Upon the Wheel* were followed soon by *Light from Beyond* and *Telka*. By 1918, the phantom writer had her own *Patience Worth Magazine*, which lasted ten issues (Christopher 1970, 128–30).

Historical Fiction

Curran eventually abandoned the cumbersome Ouija board, discovering that Patience Worth could guide her fingers while she typed and could speak through Curran's voice while a friend took dictation "at a tremendous speed" (Cavendish 1974). "Go Ye to the lighted hall to search for learning?" asked Patience in a typical communication. "Nay, 'tis a piddle, not a stream, ye search. Mayhap thou sendest thy men for barleycorn. 'Twould then surprise thee should the asses eat it." And so on, in her quaint, facile manner.

A *New York Times* reviewer praised her style: "Notwithstanding the serious quality and the many pitifulnesses and tragedies . . . [there is] much humor of a quaint, demure kind . . . [and] the plot is contrived with such skill, deftness, and ingenuity as many a novelist in the flesh might well envy" (qtd. in Christopher 1970, 128).

One Elizabethan scholar, a Professor Shelling, was less impressed. As he stated:

> The language employed is not that of any historical age or period; but, where it is not the current English of the part of the United States in which Mrs. Curran lives, it is a distortion born of superficial acquaintance with poetry and a species of would-be Scottish dialect . . . the borrowing of some dialect words and the clear misuse, misunderstanding and even invention of many others. . . . There is an easy facility of phrase almost wholly in our contemporary idiom and showing nowhere the qualities of the language of Elizabeth's or any previous age. (qtd. in Christopher 1970, 129)

I concur with this assessment.

Moreover, as is now well known, the productions of the Ouija board are actually due to "the involuntary muscular actions of the players"—as the effect was described in toy maker Isaac Fuld's application for a patent on the device. Although Fuld added, "or through some other agency," an explanation adopted by Spiritualists and other mystics, the truth can be easily demonstrated (as magician Milbourne Christopher has explained): when the board is out of sight and the alphabet scrambled, only gibberish is spelled out. (Curran rejected such "conditions" [1920, 399].)

Fantasy Proneness

Indeed, I find that Pearl Curran exhibits several traits consistent with having a fantasy-prone personality. Such persons are sane and normal but generally enjoy a rich fantasy life, which may include experiencing a previous lifetime. "While they are pretending," state

Figure 1. Pearl Curran channeled "Patience Worth" from 1913 until her death in 1937. (Photo by Joe Nickell from original at Missouri Historical Society)

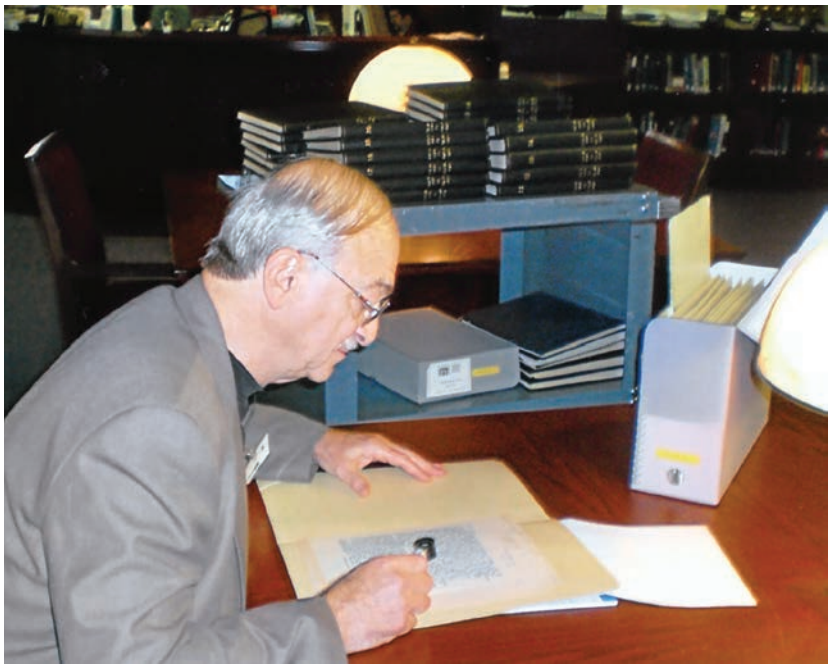

Figure 2. The "Patience Worth" papers at the Missouri Historical Society in St. Louis are a trove of "automatic" writings.

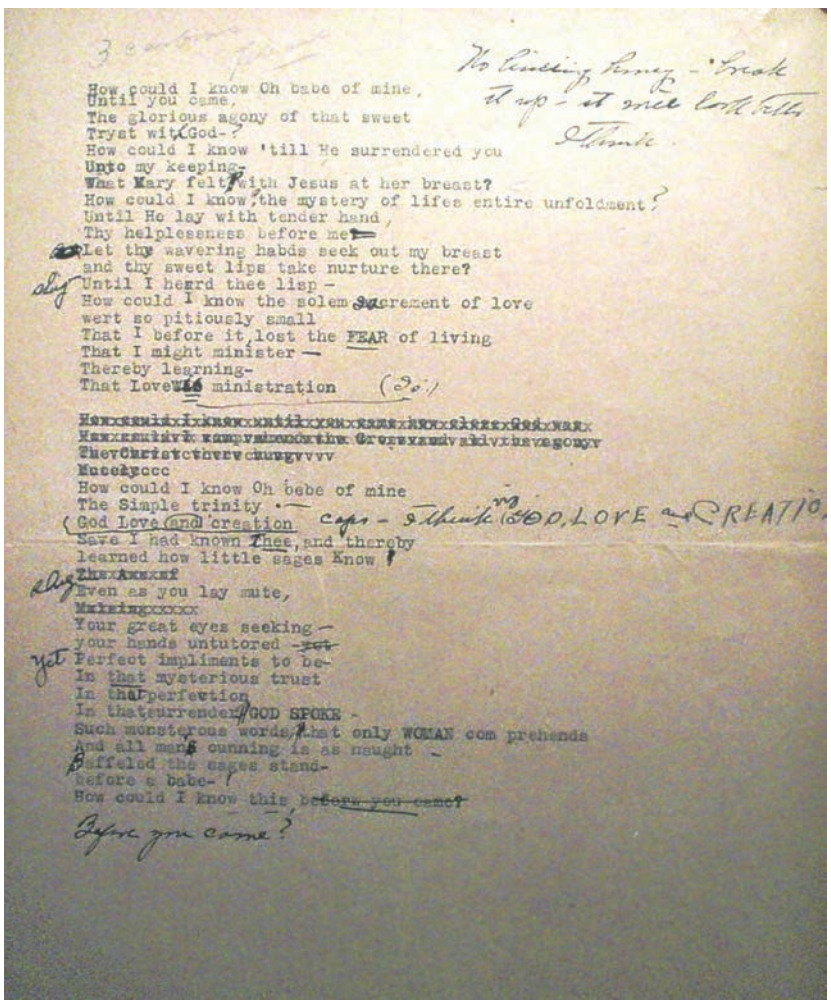
How could I know Oh babe of mine,
Until you came,
The glorious agony of that sweet
Tryst with God-?
How could I know 'till He surrendered you
Unto my keeping-
What Mary felt with Jesus at her breast?
How could I know the mystery of lifes entire unfoldment?
Until He lay with tender hand,
Thy helplessness before me-
Let thy wavering habds seek out my breast
and thy sweet lips take nurture there?
Until I heard thee lisp -
How could I know the solem sacrement of love
wert so pitiously small
That I before it, lost the FEAR of living
That I might minister -
Thereby learning-
That Love's ministration
How could I know Oh babe of mine
The Simple trinity -
God Love and creation
Save I had known Thee, and thereby
learned how little sages Know ?
Even as you lay mute,
Your great eyes seeking -
your hands untutored -
Perfect impliments to be-
In that mysterious trust
In that perfection
In that surrender GOOD SPOKE -
Such monsterous words, that only WOMAN com prehends
And all mens cunning is as naught -
Baffeled the sages stand-
before a babe-?
How could I know this before you came?
Before you came?

Figure 3. A few surviving telltale documents like this reveal that Pearl Curran did not merely take spirit dictation but engaged in the revision process—like ordinary writers. (Photo by Joe Nickell at Missouri Historical Society)

Wilson and Barber in their classic study (1983, 354), "they become totally absorbed in the character and tend to lose awareness of their true identity." They may believe they receive special messages from paranormal entities, possess psychic powers, or the like. A short autobiographical sketch penned by Curran reveals her to have been an imaginative child who played the piano at her uncle's Spiritualist church. Of her supposed communication with Patience Worth, she wrote: "I am not a Spiritualist, but am in sympathy with the furtherance of psychic facts and believe that the pioneers of today are but groping toward fact. I am not a 'medium' in the common sense. Am deeply interested in the study of psychic phenomena, *using myself as a study*" (emphasis added, Curran 1926, 15).

"Patience Worth" seems to have been, according to philosopher Charles E. Cory (1927, 432), Curran's "other self," a form of alter ego. He characterizes the phenomenon as follows (1927, 433–34):

> I accept the judgment that Patience Worth is a genius of no mean order. And, perhaps, there is in the genius of this writer a concrete illustration of what freedom a mind may achieve when released from the inhibitions that clog and check the normal consciousness. She is a dissociated self, and this dissociation has taken place in such a way as to free her from the burdens and concerns of life, from all the claims that split the will and bind the fancy. And perhaps in this fact, and all that it implies, lies the condition of her genius. The division of the self has resulted in a division of labor. To Mrs. Curran falls the care of the needs of the body, and the interests of the social life. Their reactions and distractions are hers. . . .
>
> But turn to this dissociated mind and the conditions have changed. The work of adjusting the organism to the environment being left to the other self, the inhibitions which perception places upon the imagination are removed. This sets free and unfettered the mind of Patience Worth. In the realm of the idea she lives, and there she sustains herself without effort. She acknowledges no tie or bond that might take her out of her dream. She is a dreamer that never awakens. And the conditions of this

> spell are, in a way, the conditions of her genius. With her our moments of abstraction, moments that life affords us the luxury of thought and imagination, are prolonged indefinitely. They are, in fact, a fixed condition. In other words, she lives only in a world of thought. And so far she has shown no desire to displace the other self, and alternate with her in the role of action. To do so would result in essential modification of her consciousness, and put her under inhibitions from which she is now free.

Although Curran refused to be hypnotized, and it is said she did not go into a "trance" while writing (Prince [1927] 1964, 428, 431), her *dissociated* mode is clearly similar to what today would be recognized as "self-hypnosis"—a state she entered and left easily. Therefore she probably would have been an excellent subject had she agreed to undergo hypnosis. Interestingly, Curran eventually discovered she could write short stories of her own but emphasized that she could "feel the difference between the conscious effort of the ordinary manner of writing, as against the unconscious manner in which the Patient Worth material comes to me" (1920, 403).

Smoking Gun

But Curran was not just receiving "dictation." Like other writers (including me) before and since, she embarked on the creative process and was carried to that far-away place in the mind whence inspiration comes, producing things that often seemed quite mysteriously bestowed—as if from one of those goddesses of art in Greek mythology, the Muses. Curran may have simply perceived her muse as a character named Patience Worth.

I have researched the matter over the years. In 2010, after speaking to the Rationalist Society of St. Louis on "Hunting for Ghosts and Spirits," I was able to study Pearl Curran's writings at the Missouri Historical Society Archives (which very graciously accommodated me on a day they were otherwise closed). For five hours I pored over the Pearl Curran/"Patience Worth" papers—numerous boxed documents and twenty-nine bound volumes of typescripts (Figure 2). Even though it is known that "Patience" could compose on demand (Prince [1927] 1964, 56, 281–300), I found evidence that some of the writings were the product of the creative process—showing various revisions—rather than, as alleged, mere dictation from the supposed spirit of the nonexistent "Patience Worth" of the seventeenth century.

For example, I found two versions of a 1920 poem, "My Love Is Old." In the bound typescript, vol. 12, p. 2302, the last line of the poem reads, "Who bending whispers forget, forget." But there is an earlier loose manuscript of that same page with the typed line originally reading, "Who bending responds forget, forget"—but the word *responds* has been stricken and the word *whispers* penned instead.

Several poems had fold marks in the paper, indicating they had been mailed to persons for whom they were written—one "For Grace Parrish," for instance. When that poem appeared in the bound typescripts, numerous changes in punctuation and line divisions had been made, and stanza divisions had been added. More telling is another poem for Parrish containing some very different text in the typescripts, revised wording, a line added, and changes in punctuation and line divisions.

Quite revealing is a typed page of yellowed copy paper with penciled notation ("3 carbons please") that is roughly typed and marked over. A few typed lines have been crossed out (having read, "How could I know until you came how close God was/How could I comprehend the Cross and all the agony . . ."). There are also numerous penned edits and revisions in Pearl Curran's handwriting, as well as a note to someone addressed as "honey" (presumably a typist) to "break it up—it will look better I think," apparently referring to the line breaks (see Figure 3).[1]

I suspect that there were once many more such drafts but that they were subsequently destroyed, replaced by what manuscript experts call "fair copies"—that is, neat, final versions as preserved in the bound volumes.

Conclusions

The weight of the evidence—the lack of historical record for "Patience Worth," the fantasy proneness of Curran (consistent with producing an imaginary "other self"), the writings' questionable language, and the evidence of the editing and revision process—indicates that Patience was merely a persona of Curran's.

I can relate to that: When I visited the archives I was accompanied by a number of my own personas, including paranormal investigator, historical document examiner, poet, fiction writer, editor, literary critic, forensic linguist, handwriting expert, photographer, and more—all of which played their role in my examination of the manuscripts. The century-old case can now be closed. It is about time. ■

Acknowledgments

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Note

1. This document is in the third of three folders of loose documents dated September 8–15, 1924, Patience Worth Collection, Missouri Historical Society, St. Louis, Missouri.

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[THINKING ABOUT SCIENCE MASSIMO PIGLIUCCI

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Psychoanalysis and Social Constructivism

There seems to be an emergent consensus in philosophy of science that Freudian psychoanalysis has been degraded to the status of pseudoscience—just as Karl Popper suggested when he starting writing about the "demarcation problem," the question of what separates science from nonscience, at the beginning of the twentieth century. (Popper's other example of pseudoscience was Marxist theorizing about history.) Indeed, recently newspapers in both England and the United States commented on the departure of Frank Cioffi, one of the leading critics of Freud within philosophy of science.

A colleague of mine, Maarten Boudry at the University of Ghent (Belgium), has recently added an interesting twist to the status of Freudian psychoanalysis in a paper he cowrote with Filip Buekens that was published in the journal *Theoria* in 2011. Boudry and Buekens have argued that psychoanalysis provides a good model of what science would be like if social constructivist theories of knowledge were correct about the nature of science. They then turn around and use this suggestion as an indirect critique of the social constructivist research program in the sociology of science.

Social constructivism is the idea that science is, in a strong sense, a social activity that is "constructed" by its member participants—that is, the scientists. In a weak sense this is obvious: science is indeed a social activity engaged in by a certain type of human being. But in the strong sense this amounts to the claim, as sociologist Harry Collins infamously put it, that "the natural world in no way constrains what is believed to be." As another champion of social constructivism, David Bloor, put it, "[The sociology of scientific knowledge is] symmetrical in its style of explanation. The same types of cause would explain, say, true and false beliefs." In other words, scientific theories are accepted or rejected not because they do or do not match the empirical evidence, but rather for the same underlying sociological reasons that have to do with the social structure of science, particularly with the distribution of power within that structure.

Social constructivism isn't taken seriously either by scientists themselves or by philosophers of science, and for good reasons. Boudry and Buekens quote André Kukla as pointing out that the field is replete with "reverse switcheroos": "[You] put forth a strong version of the hypothesis [about how science works], and when it gets into trouble, you retreat to a weaker version, pretending that it was the weaker thesis that you had in mind all along."

But, argue Boudry and Buekens, Freudian psychoanalysis does indeed fit the description of "science" given by social constructivists. The above-mentioned Cioffi, for instance, pointed out that Freud (and his followers and eventual rivals) didn't seem to be aware of the fact that he was interpreting evidence refuting his theory as yet another instance of confirmation of the theory. For instance, Freud thought that his patients had an (obviously unconscious) desire to see his theories fail, which would naturally account for the patients sometimes behaving in ways contrary to what the theory would predict. In essence, Freud was winning regardless of the evidence: if the latter confirmed the theory, good; if it didn't, it was the result of his patients' unconscious resistance—also "predicted" by the theory! This isn't very different from psychics who explain the failure of controlled experiments on their alleged abilities by invoking a negative effect on psi "energy" caused by the proximity of skeptics.

Freud was winning regardless of the evidence: if the latter confirmed the theory, good; if it didn't, it was the result of his patients' unconscious resistance—also "predicted" by the theory!

Boudry and Buekens also note that critics like Cioffi and several others have demonstrated that it is pretty much impossible to pin down any orthodox or standard theory of psychoanalysis distinct from an array of "immunizing strategies" concocted to twist uncooperative evidence into supporting the psychoanalyst's claim. Again, this is what one typically observes in proponents of pseudoscience, from parapsychology to UFOlogy, from creationism to astrology.

Boudry and Beuekens' conclusion is that critics of psychoanalysis have exposed the fact that the theory is, indeed, a social construction of psychoanalysts themselves. There are no facts of the matter to be discovered about how the Freudian mental landscape works, because the very idea of a Freudian-type mental landscape is a (extremely flexible) figment of Freud's (and his colleagues') imagination. Collins's comment about theories being unconstrained by the natural world—while absurd in the case of actual science—fits psychoanalysis (and any other pseudoscience) perfectly well.

But, one might object, psychoanalysis has made progress. For instance, the Freudian concept of penis envy was gradually abandoned during the second half of the twentieth century, to be replaced by new concepts like "breast envy" and "vagina envy" (I kid you not) in a number of psychoanalytical schools. As Boudry and Buekens point out, however, this change is not at all analogous to, say, the transition from Newtonian to relativistic physics. It wasn't the result of new empirical discoveries or theoretical insights but more obviously the outcome of changed cultural sensibilities.

Ironically, some psychoanalysts have themselves embraced social constructivism, perhaps (unconsciously?) aware that the sociological doctrine, if extended to real science, would provide a perfect shield for the respectability of their speculations (hey, scientists do it too!). In the end, constructivist sociologists of science would do much better in aiming their tools at pseudoscience, all the while recognizing that science is a very different kind of beast, one for which the natural world does a lot of the "constraining." ■

[NOTES ON A STRANGE WORLD MASSIMO POLIDORO

Massimo Polidoro is an investigator of the paranormal, lecturer, and cofounder and head of CICAP, the Italian skeptics group. His website is at www.massimopolidoro.com.

Ten Myths about the *Titanic*

The sinking of the *Titanic* has become a modern folktale; as such, its story has been clouded by many myths and misconceptions that are still flourishing a century after the disaster. Legends began spreading before the ship had even begun to sink in the Atlantic Ocean that terrible night in April 1912.

1) **The Unsinkable Ship.** One of the most often repeated claims is that the White Star Line, owner of the ship, had claimed that the *Titanic* was unsinkable. In truth, the company never made that claim; however, at the time of the *Titanic*'s fitting out, there was a special edition of *The Shipbuilder* magazine in which the ship was described as "practically unsinkable" due to its double bottom and sixteen watertight compartments.

2) **A Predictable Disaster.** Fourteen years before the *Titanic* disaster, the novel *Futility* by Morgan Robertson described the sinking of a gigantic ship called the *Titan* after it hit an iceberg in the Atlantic in the month of April. A case of prophecy? Not quite. Martin Gardner, in his *The Wreck of the* Titanic *Foretold?*, explains that if you were a sea writer like Robertson and wanted to write a catastrophic novel about the sinking of a ship during peace time, an iceberg would be the only thing that could do the job. The most likely place for ships to meet icebergs was in the Atlantic Ocean, and the month of April was the riskiest time because warmer weather causes bergs to wander south. The risk presented in the novel was actually very real, and other ships had also gone through such accidents in the past. As for the characteristics and the name of the ship, it has been discovered recently that the White Star Line had told the *New York Times* in 1892—that is, six years before Robertson wrote his book—that they were planning to build ships of the same exact kind as the one later described by the writer. They also told the *Times* that the first one might be named *Gigantic*. Not bad for a hint!

3) **No Pope, Please.** This one can be found repeated in most books dealing with strange omens related to the disaster. Rumors have it that the *Titanic*'s hull number was 360604, which, when viewed through a mirror, spells the anti-Catholic statement "NO POPE" —a heresy in the ultra-Catholic parts of Belfast, where the ship was built. However, it is just a myth; as every scholar of the *Titanic* will tell you, the hull number was a much less scary 401.

4) **Curse of the Mummy.** The story about the curse of the Mummy of Amen-Ra destroying the *Titanic* is pure fantasy as well. However, it stems from an actual story related by journalist and famous Spiritualist William T. Stead, a passenger on the ship who lost his life the night before the disaster. Stead told it to some of his First-Class friends, who survived and related it to journalists, who in turn sensationalized it incredibly. The story tells of the painted lid of a sarcophagus that depicted a face so scary that many thought it meant bad luck. It was not a mummy, then, but only the cover of a sarcophagus. It probably belonged to a priestess of the cult of the god Amen-Ra; *Pearson's* magazine had devoted a cover story to it in the August 1909 issue. It was quite a well known archaeological item, then, housed at the British Museum. Despite the many legends linked to it, the sarcophagus was just a beautiful relic from ancient Egypt, and it never left the museum (it certainly never was on the *Titanic*), where it can still be seen in Room 62.

5) **The Priceless *Rubaiyat*.** It is claimed that the copy of *The Rubaiyat*, a selection of poems attributed to Omar Khayyám (1048–1131), a Persian mathematician, astronomer, and philosopher, present aboard the *Titanic* was absolutely priceless. It's true that the book was a deluxe edition purchased at Sotheby's by an American collector—the cover had a peacock design made from gold and studded with over one thousand rubies and emeralds. But far from the usually claimed fortune, the book had been bought for just £405 at the auction. It would certainly not be worth the millions of dollars needed to attempt a salvage expedition (many such missions so far have never found *The Rubaiyat*).

6) **No Binoculars Aboard Ship.** This is partially true; the lookouts of the *Titanic* did not have any binoculars, which were on the ship but inaccessible. The original second officer, David Blair, was discharged right before departure because a new chief officer, Henry Wilde, was brought on board by Captain Smith. The remaining officers' ranks were therefore changed, and Blair was the one removed to make way for Wilde. The binoculars were inside a locker in the cabin that Blair had originally occupied, but when he left the ship he mistakenly took the keys along. Historians, however, are of the opinion that binoculars would have made no difference in spotting the iceberg on the pitch black night of the sinking.

7) **Open Those Watertight Doors!** According to one theory, if the watertight doors had been opened, the *Titanic* would have sunk on an even keel and therefore, perhaps, remained afloat long enough for rescue ships to arrive. In reality, this would have been impossible. First, there were no watertight doors between the first four compartments—thus it was impossible to lower the concentration of water in the bow significantly. Second, it has been shown that any significant amount of water abaft boiler room no. 4 would have resulted in capsizing of the *Titanic* about thirty minutes earlier than the actual time of sinking. Additionally, the lighting would have been lost about seventy minutes after the collision due to the flooding of the boiler rooms.

8) **The Captain Shot Himself.** A few days after the sinking, wild and contradicting stories about the final moments of Captain Edward Smith began circulating. It was said that he shot himself when he realized that the ship was doomed; it was also said that after the sinking he was seen swimming desperately in order to save babies from the icy waters. In truth, there is no evidence either that Smith committed suicide or that he tried to save babies. Smith was certainly responsible in part for the disaster, having failed to slow the ship after receiving many notices of ice in the area during the day. However, it is likely that Captain Smith died, like most of the other officers did, while trying to save as many passengers as possible.

9) **The Extreme Survivor.** It is often reported that fireman Frank Tower not only survived the sinking of the *Titanic* but was also aboard the *Empress of Ireland* when she collided with the *Storstad* and later on the *Lusitania* when that vessel was torpedoed and sunk by a U-boat in May 1915 off the southern coast of Ireland. The truth, as usually happens with such unlikely legends, is that no person by the name of Frank Tower appears in any crew lists for those three vessels.

10) **The Double Ship Conspiracy.** What about the story that it was not the *Titanic* that went down in the Atlantic but its twin sister, the *Olympic*, in order to scam the insurance company? First related by Robin Gardiner and Dan van der Vat in the book *The* Titanic *Conspiracy*, the idea was that an already-damaged *Olympic* (disguised as the *Titanic*) was purposefully sunk in order to collect insurance money. Apart from the absurdity of the theory, it was shown to be false when parts of the wreck were recovered. The *Titanic*'s construction number 401 was found on all of them. The number of the *Olympic* was 400. ■

The Daily Mirror
DISASTER TO THE TITANIC: WORLD'S LARGEST LINER SINKS AFTER COLLIDING WITH AN ICEBERG DURING HER MAIDEN VOYAGE

The myth that a mummy's curse destroyed the *Titanic* stems from a story that William T. Stead (center) related to fellow First-Class passengers. Stead's tale may have been inspired by a 1909 cover of *Pearson's* magazine (right).

Sheaffer's "Psychic Vibrations" column has appeared in the SKEPTICAL INQUIRER for more than thirty years; its highlights have now been published as a book (Create Space 2011). Sheaffer blogs at www.BadUFOs.com, and his website is www.debunker.com.

Join the Boycott to Protest the CIA Cover-Up of President Obama's Trips to Mars

You just can't make this stuff up. For the past few years I have been reporting from time to time on the absurd claims of a group of UFOlogists who call their study exopolitics—"political implications of the extra-terrestrial presence." That there is an "extra-terrestrial presence" on Earth, they have no doubt. Alfred Lambremont Webre claims to have been the founder of exopolitics, although in reality Michael Salla can probably claim that dubious honor; Webre's website is exopolitics.com, and Salla has exopolitics.org.

Lately Webre's claims have gotten so bizarre (e.g., a war between the Andromeda Council and the Reptilians and Americans being teleported to a secret base on Mars to meet with aliens) that even others in exopolitics have become alarmed and begun distancing themselves from him. As Salla recently wrote on his website, "Webre is a marginal and controversial figure in the network of exopolitics researchers and activists that has formed around the world. Webre's writing and behavior is seen as too bizarre and controversial for most credible exopolitics researchers to use" (http://exopolitics.org/Exo-Comment-98.htm). Nonetheless, Webre's far-out articles on Examiner.com were being read by as many as 400,000 people each month—until recently, that is, when Examiner.com finally gave him the boot.

Webre's colleague Jon Kelly, "a world-famous expert in the application of voice-based disclosure technology for revealing UFO secrets" (whatever that means), writes (http://tinyurl.com/cgymy3p):

> Kuala Lumpur War Crimes Tribunal Judge and founder of Exopolitics Alfred Lambremont Webre is calling for consumers to occupy an immediate boycott of pay-per-impression advertising funded news website Examiner.com. . . . Examiner.com's corporate publication ban against the Seattle Exopolitics Examiner is an Illuminati agenda-inspired media hit targeting the columnist who revealed President Barack Obama's participation in the CIA's secret Mars visitation program [http://tinyurl.com/7bc93mo].

Pieces on Examiner.com are presented to make you think you're reading a news story. Once a colleague and I were discussing one of Webre's absurd columns on Examiner.com that claimed NASA was promoting (not debunking) fears of an "extinction level event" from Comet Elenin (http://tinyurl.com/3njgzfj). He asked me, "What kind of newspaper is publishing crazy stuff like this?" I replied, "I don't think it's actually a newspaper; it's more like this guy's blog." In his feud with Examiner.com, Webre spelled out Examiner.com's business model:

> During 2009 many of the writers were receiving $0.01 per page view. Examiner.com later offered a variety of pay scale options to their writers. Examiner.com now bases compensation on variables such as subscriptions, page view traffic and session length. . . .Examiner.com derives the bulk of its revenue from consumer (reader) click-throughs. Every time you as a reader click through to read an article on Examiner.com, the company is paid a royalty by its advertisers.

Let's see, one cent per page at 400,000 pages per month gets you $4,000 a month, although Webre suggests that might be only in a good month. So the formula for success as a UFO writer

seems to be: make up the most outrageous claims you can think of and put it on Examiner.com, then sit back and collect the coins dropping into the hopper. And here am I, stupidly wasting my time and effort writing skeptical articles! Webre does not say exactly what happened to get him kicked off Examiner.com. It cannot be that they are concerned about their journalistic credibility, for they have none. Webre does say, however, "Examiner.com has been criticized for its lack of verification and fact-checking of stories published on the site, including accusations of plagiarism."

Webre's request is simple: "Please let your friends and networks know you are boycotting Examiner.com because it is promoting the CIA's Obama on Mars cover-up, and its direct assault on the Truth movement and Truth movement journalists like Alfred Lambremont Webre." How about that for a Facebook status?

* * *

A 'Classic' UFO Photo, Now in 3D!

In Santa Ana, California, on August 3, 1965, highway worker Rex Heflin took three photos of a supposed UFO through the window of his van using his Polaroid instant camera. NICAP and many prominent UFOlogists have long touted this series of photos as "classic." This object supposedly flew right over the Marine Corps El Toro Air Station and the Santa Ana Freeway (Interstate 5) in broad daylight, but no one else saw it. (See my book *UFO Sightings*, Prometheus Books, 1998, pp. 91–93.) In these photos, distant objects are hazy because of the Los Angeles smog, but the UFO is sharp—probably because it is tiny and very close to the camera. For many years the original prints could not be investigated because Heflin claims that an investigator came to his house, flashing an ID supposedly from NORAD, and confiscated them. (At least Heflin did not claim that the Men in Black came for his prints or that the dog ate them.) So all we had left were copies made from the originals. The Air Force's Project Bluebook listed the Heflin photos as a "hoax."

However, "In 1993, Heflin's Polaroid originals surfaced unexpectedly under mysterious circumstances" (http://tinyurl.com/75bp7ba). Heflin had retired from busy and smoggy southern California to a small town in northern California. He says that he received two calls from a mysterious woman telling him to check his mailbox. When he did, he said he found his original three UFO polaroids in a plain brown envelope. Or Heflin just made the whole thing up—the "loss" of the originals as well as their "recovery." Heflin died in 2005.

Skeptics have argued that Heflin's UFO appears to be a tiny model, just a few inches in size, hanging from something like a fishing pole propped up over the cab of his van. William K. Hartmann, who investigated the case for the Condon Report (Case 52, http://tinyurl.com/7vup348), successfully replicated Heflin's photos in exactly this manner by using a suspended lens cap.

However, only in 2006 did a still-anonymous person, using the alias "Enkidu," make an extremely important finding. In a discussion thread on the conspiracy-oriented website Above Top Secret (www.abovetopsecret.com/forum/thread208479/pg1), Enkidu argues that Heflin unintentionally created a 3D photo of his UFO. Assuming that the UFO was attached in some way to the truck, by moving the camera a few inches between the exposures, Heflin has produced a near-perfect stereo pair, as can be seen in stereo viewers. The photos in Figure 1 were reversed by Enkidu to allow easier viewing of the 3D effect without a stereo viewer by simply crossing one's eyes. When you do that, the UFO is seen to be tiny. It's clearly farther away than the truck's mirror but much closer than the roadside vegetation or the distant trees. Responding to criticism, Enkidu writes, "Yes, it's possible that the UFO moved between the time the first photo was taken and the second. But it would have to move exactly horizontal to the way the camera moved, because there's no apparent difference in the size of the top part of the ship. It could only tilt forward. It didn't go up or down, and it didn't get nearer or closer. The odds of that happening are pretty slim." Great work, Enkidu—the Heflin photos are *busted*!

Figure 1. Internet commenter Enkidu argues that Rex Heflin inadvertently created a 3D image with two of his photos, supporting the argument that the UFO is actually a tiny model.

[THE SCIENCE OF MEDICINE STEVEN NOVELLA

Steven Novella, MD, is assistant professor of neurology at Yale School of Medicine, the host of the *Skeptics' Guide to the Universe* podcast, author of the *NeuroLogica* blog, executive editor of the *Science-Based Medicine* blog, and president of the New England Skeptical Society.

Pseudoscience in Our Universities

The group Friends of Science in Medicine has recently formed in Australia, and they now have over 400 professional members. They felt the need to come together over a disturbing trend—the infiltration of rank pseudoscience into once respected universities.

It is a sign of our times that we have to defend having standards of good science in the practice of medicine and the teaching of a science-based curriculum in universities. High standards of science in medicine are necessary in order to ensure, as best as we can, that treatments and interventions are safe, effective, and ethical. It is extremely complicated and tricky to determine safety and efficacy. Humans suffer from numerous mechanisms of self-deception, cognitive flaws and biases, poor grasp of statistics, and perceptual failings that are likely to lead us astray. In fact our biases tend to systematically lead us to false conclusions that we wish to be true, rather than to the truth.

These flaws, biases, and cognitive errors make it difficult to come to reliable conclusions in any area of exploration, but perhaps particularly so in the applied science of medicine. This field is further plagued by placebo effects, which represent the above effects in addition to a complex emotional and physical response to the nonspecific aspects of getting attention from an attentive practitioner.

Science is the only system that we have developed that systematically controls for all of these biases and flaws to see through to reliable information. Science endeavors to be transparent, thorough, and rigorous. The application of scientific principles has demonstrably transformed medicine (and human knowledge in general) for the better. As a society we should not lightly abandon the principles of science or try to change them to meet the needs of the current fads.

Universities in particular are supposed to be the exemplars of scholarship and intellectual legitimacy. People believe universities are intellectual leaders, not followers, and they are correct (or at least, they should be). Teaching a topic in a university is absolutely an endorsement of the legitimacy of that topic. We can distinguish between teaching about something and teaching the thing itself. It is okay to teach about so-called complementary and alternative medicine (CAM) as a sociological phenomenon or even as an example of pseudoscience. Practitioners also need to learn about any method their patients may be using or about which they are curious. Credulously teaching CAM, however, is an endorsement, the granting of the imprimatur of the university.

It is tempting to cater to prevailing fads, to acquiesce to the vocal advocates and give them what they want, especially when there isn't much protest. That is exactly what intellectual integrity is about, however—doing the right thing because it is right, not because it is popular or expedient.

I will acknowledge perhaps the only legitimate argument on the other side: that of academic freedom and diversity of opinion. I agree with the principle that a university should also be a place for the free exchange of ideas and should not easily impose censorship. Proponents of nonsense, however, have taken this principle too far. Academic freedom needs to be tempered with quality control. Professors should not be allowed to teach absolutely anything they want without limit. The university has a duty to ensure that the minimal standards of academic legitimacy are met.

This duty includes ensuring that science is taught in science classes. This debate has come up with reference to teaching creationism as science as a matter of academic freedom. Such freedom does not extend to the point of teaching demonstrable pseudoscience as if it were a legitimate science. The exact same thing can be said about teaching homeopathy, for example, as if it were legitimate science-based medicine.

The argument above should not be difficult to make and should resonate with academics. It has worked well in the United Kingdom, spearheaded mostly by David Colquhoun, who has used freedom of information requests to obtain the CAM curricula at universities teaching CAM, and then simply sent them to the dean and/or board of trustees of the university. This one act has led to the removal of CAM courses from universities in the United Kingdom. Simply shining a light on what was happening was enough.

In the United States we are having a harder time, although we have had some successes also. The American Medical Student Association (AMSA) has been infiltrated by CAM proponents who have managed to get requirements for CAM to be taught in American medical schools. Of course, we can still teach about CAM (which I actually advocate) rather than promote pseudoscience—something that is not a subtle distinction but is often difficult for some to make.

Australia is perhaps having the most difficult time with this issue, leading to the formation of the Friends of Science in Medicine. Their request is simple: no pseudoscience in universities. They have helped bring the debate to the forefront. CAM's greatest ally in infiltrating universities is stealth. I have seen this infiltration occur deliberately under the radar with the stated goal of avoiding too much attention, which might draw criticism. This violates the principle of transparency, and it illustrates why focusing attention on this trend is so useful.

Of course, CAM proponents are not going to just lie down and go away.

There have been many responses to the criticism of teaching CAM in medical schools, none of which is valid. In Australia, the most frequently quoted defender of teaching on nonsense in universities is Iain Graham, professor at Southern Cross University's School of Health. He is quoted in several articles, but this quote responding to criticism from John Dwyer, emeritus professor of medicine at the University of New South Wales, is representative:

> Professor Dwyer's sweeping discussion about the issue are to do with quackery really, and the rooting out of poor practise. But if we look historically at the evolution of health care and the health professions, there are many similarities with where things started.
>
> He mentioned homeopathy for example, well homeopathy is as old as Greek Hypocrates in terms of practising medicine. (Australian Broadcasting Company 2011)

Here we have a blatant misstatement of fact combined with a logical fallacy. Graham probably (if I am being generous) did not mean to state that homeopathy can be traced back to ancient Greece, just that some CAM therapies can. Homeopathy was invented by Samuel Hahnemann about 200 years ago (Novella 2009).

But I wonder what CAM modalities he had in mind. Chiropractic? About 100 years ago. Therapeutic touch? A few decades ago. Acupuncture is a complex question, but what passes for acupuncture today is less than 100 years old. Perhaps he was thinking about bloodletting or trepanation.

However, it is true that some basic concepts, like the notion of "life energy," can trace their roots to ancient Greece and other ancient cultures. However, such notions are pre-scientific nonsense. Scientists abandoned the notion of life energy over a century ago because there was no evidence that such a force exists (and there still isn't). After figuring out all the basic processes of life, there was essentially nothing left for the alleged life force to do.

For some reason, however, Graham believes that antiquity in science is a virtue—the "argument from antiquity" logical fallacy. The unstated assumption is that if an idea has survived for hundreds or thousands of years it must be legitimate. This is demonstrably false. Galenic medicine (bloodletting, purging, etc., based on the notion of the four humors) survived for thousands of years, and yet it was based on complete and utter primitive nonsense. In fact its tendrils still exist. There is still bloodletting, cupping (which is just another form of bloodletting), and similar practices going on in the world. It was replaced in the West because of the advent of science in medicine—a trend that Graham apparently wants to reverse.

Graham's second swing and a miss: "Eighty per cent of Australians seek alternative therapies," Graham is quoted as saying by Australian newspaper the *Northern Star*. "Obviously orthodox medicine is not working for everyone" (www.northernstar.com.au/story/2011/12/12/alternative-therapy-course-not-magic/). I highly doubt that the 80 percent figure is correct. Most such figures are highly inflated by including all sorts of practices in the CAM category, such as exercising and eating organic food—and sometimes prayer is included. U.S. surveys show the percentage of CAM use is around 33 percent (NIH 2008), but this is mostly things like massage and chiropractic manipulations. Homeopathy use is around 3–4 percent, and acupuncture 6–7 percent. In fact, only manipulation and massage were in the double digits.

This is all marketing deception. Create a false category (CAM), pad it out with commonly used methods, and then claim that the extreme fringes are therefore getting more popular. I don't know how Graham got to 80 percent (I doubt such methods are that much more popular in Australia than in the United States) but it is close to one survey from 2007 that found that 69 percent of Australians used one of the seventeen most popular forms of CAM in the last year (Xue et al. 2007). However, that study included in its list martial arts, yoga, massage, meditation, and taking multivitamins. I am not sure what taking multivitamins says about the popularity of homeopathy, but apparently Graham thinks it is significant.

In any case, I will grant that CAM as a marketing concept has been somewhat successful—and even that it has gained popularity recently (although not as much as advocates would have you think). That is entirely irrelevant, however, to the question of whether or not any particular CAM modality is science-based and appropriate for a university curriculum (which is the question at hand).

Universities are supposed to be thought leaders with intellectual standards that rise above the mere notion of popularity. They are supposed to uphold academic standards of scholarship, especially in scientific disciplines with high standards in science. It is therefore very odd and disturbing to defend a university policy based upon popularity. Should we allow surveys of public opinion to determine whether or not we teach creationism or astrology in our universities?

It is good to see some organized backlash against the infiltration of pseudoscience and nonsense into the very institutions that should be teaching against such things. It is good to see more and more articles written about this topic—we want attention for the issue. We want a discussion of the merits of our position verses the pro-CAM position. Let's have a very public debate about the facts, about what is science, and how we as a society should determine what medical interventions are worth our public support.

We will confidently stand by our position. CAM proponents, like creationists, have nothing but weak and fallacious—and long discredited—arguments on their side. ■

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Gender Personality Differences: Planets or P.O. Boxes, Evidence or Ideology?

Why are people so afraid of the idea that the minds of men and women are not identical in every way?—Steven Pinker, The Blank Slate *(2002)*

The mere suggestion that one group of people is cognitively or emotionally distinct from another can leave many of us speechless and squirming in our seats. The effect is intensified, of course, in the regrettable event of historical discrimination, especially when the differences are alleged to be innate.

Scientists of many stripes have bravely confronted, struggled with, and evidently resolved the issue as it pertains to "race." Such classifications lack sturdy biological bases, the current consensus holds, and their very existence relies on nothing more concrete or dependable than cultural convention and political expediency.[1]

Gender or *sex* (I use the terms interchangeably here) is similar in some respects, but it is clearly distinct in others. Some biological differences between men and women are both unmistakable and abundantly appreciated. Combat can erupt, however—perhaps most furiously in intellectual circles—over questions involving mental differences and, assuming their existence, over their proposed causes.

In a recent column (SI, July/August 2011), I investigated the origins of female "underrepresentation" in high-end science, technology, engineering, and math. The latest analyses had suggested that rather than being discriminated against, qualified women tended to choose people-centered over thing-centered professions—that is, the somewhat narrow mental trait examined was *interest*.

Other studies have explored broader gender differences in *personality*—a related and at least equally sensitive domain. In a highly influential 2005 paper, for example, Janet Hyde, University of Wisconsin–Madison professor of psychology and women's studies, rebuked the popular media and general public for their apparent fascination with an assumed profusion of deep psychological variances between genders (Hyde 2005).

After reviewing forty-six meta-analyses on the subject, Hyde proposed a new model. The *gender similarities hypothesis* (GSH) holds that "males and females are similar on most, but not all, psychological variables." Because most differences are negligible or small, and because very few are large, Hyde contended, "men and women as well as boys and girls are more alike than they are different." Physical aggression and sexuality were offered as exceptions.

But in a new study, "The Distance Between Mars and Venus," Hyde's renowned hypothesis was directly and expressly challenged by a trio of Europeans led by Marco Del Giudice, evolutionary psychologist at the University of Turin, Italy (Del Giudice et al. 2012). Having subjected a sample of 10,261 American men and women between ages fifteen and ninety-two to an assessment of multiple personality variables, Del Giudice obtained results he and his team described as "striking."

The "true extent of sex differences in human personality," he argued, "has been consistently underestimated." Del Giudice now compares personality disparities to those of other psychological constructs like vocational interests and aggression. When properly measured, he reports, gender personality differences are "large" and "robust." Indeed, roughly 82 percent of his cohort delivered personality profiles that could not be matched with any member of the opposite sex.

So by what method should researchers measure these distinctions? The Europeans broke new ground by combining three techniques. First, to enhance reliability and repeatability, they estimated differences based on latent factors rather than observed scores. Second, instead of employing the so-called "Big Five" variables (extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience), Del Giudice and company applied fifteen narrower traits in order to assess personality with "higher resolution." Finally, they chose multivariate over univariate effect sizes—thus aggregating rather than averaging variances—to more accurately reveal "global" sex differences.

Hyde swiftly posted her response. Roundly disparaging Del Giudice's statistical method, she charged that it "introduces bias by maximizing differences." In the end, she continued, the Europeans' "global" result is merely a single and "uninterpretible" dimension that only "blur[s] the question rather than offering higher resolution." The GSH stands in-

tact, she insisted. The true expanse between genders, Hyde argued, is anything but astronomical: instead, it more resembles "the distance between North Dakota and South Dakota."

Either way, a third researcher teased, "you'll still have a mighty long way to walk." Richard Lippa, professor of psychology at California State University, Fullerton, proposed an attractive analogy in the Italian's defense. Consider sex differences in body shape, he suggested. The approach underlying Hyde's GSH would average certain trait ratios—shoulder-to-waist, waist-to-hip, torso-to-leg length, for example—and likely declare that men and women have similar bodies. By contrast, Del Giudice's multivariate method would probably generate the much more intuitive conclusion that "sex differences in human body shape are quite large, with men and women having distinct multivariate distributions that overlap very little." The Italian offered a similar and equally effective analogy comparing male and female faces.

Del Giudice finds Hyde's "single dimension" criticism ironic indeed because his method's essential point, he says, was to integrate multiple personality factors rather than isolate them. Most dramatically in univariate terms, those traits included sensitivity, warmth, and apprehension (higher in women), and emotional stability, dominance, vigilance, and rule-consciousness (higher in men).

Nor does he see an interpretability problem. Del Giudice's "weighted blend" of fifteen personality traits, he argues, provides a concrete and meaningful description of global differences informing us of a 10 to 20 percent overlap between male and female distributions. He denies as well Hyde's claim that his techniques were either controversial or prone to maximizing bias. To the contrary, he told me, his team simply "thought hard about the various artifacts that can deflate sex differences in personality, and took steps to correct them."

Steven Pinker's provocative query denouncing our fear of sex differences was largely rhetorical, of course. He answered the question soon after asking it: "The fear," he acknowledged, "is that different implies unequal" (Pinker

"Contemporary gender researchers, particularly those who adopt social constructionist and feminist ideologies, often reject the notion that biologic factors directly cause gender differences."

— Richard Lippa, professor of psychology at California State University, Fullerton

2002). If we momentarily assume that gender personality differences are substantial, the next issue to confront might be whether those differences are driven more by culture or biology. In either case, certain groups may be forced to rethink some much cherished ideas and practices.

Lippa recently probed the ultimate "nature vs. nurture" question in a review of two meta-analyses and three cross-cultural studies on gender differences in both personality and interests (Lippa 2010). In the end, he discovered that women tend to score significantly higher over time and across cultures in the Big Five categories of agreeableness and neuroticism and, as others have found since, that they gravitate more toward people-centered rather than thing-centered occupations.

The Californian then described two basic sets of nonexclusive theories under which such evidence is typically evaluated. Biological theories, of course, focus on genes, hormones, neural development, and brain structure, for example. These models are inspired by our knowledge of evolution. By contrast, social-environmental theories concentrate on stereotypes, self-conceptualization, and social learning. Here, cultural influences are thought to dominate.

Supporters of distinct sub-theories would no doubt evaluate the evidence in varying ways. But significant gender differences that are consistent across cultures and over time, Lippa contends, are more likely to reflect underlying biological rather than social-environmental causes. Similarly suggestive, the author says, is the fact that such divergences tend to be greater in relatively "modern," individualistic, and gender-egalitarian societies.

In his new paper, Del Giudice chose not to directly engage the difficult question of underlying causes. Nonetheless, he reminds us that evolutionary principles—sexual selection and parental investment theories, in particular—provide us with ample grounds to "expect robust and wide-ranging sex differences in this area." Most personality traits, he says, "have substantial effects on mating- and parenting-related behaviors."

Even so, Hyde answers, more than one evolutionary force may be at play here. Although sexual selection can produce sex differences, she admits, other forms of natural selection can render sex similarities. "The evolutionary psychologists," she reckons, "have forgotten about natural selection."

On these limited questions, truly common ground seems scarce indeed. Why should the authors interpret the evidence so differently? Of course no member of any group or human institution is impervious to personal or philosophical biases. One might reasonably expect academics to be more objective than others, but for what it's worth, that has seldom been my experience as a science writer.

In his review, Lippa argued generally that "contemporary gender researchers, particularly those who adopt social constructionist and feminist ideologies, often reject the notion that biologic factors directly cause gender differences." And, more pertinent here, he claims that Hyde has long "ignored 'big' differences in men's and women's interests," and that the GSH "is, in part, motivated by feminist ideologies and 'political' attitudes."

Hyde denies the accusation categorically: "The GSH is not based on ideology," she told me. "It is a summary of what the data show . . . data from millions of subjects." However, one might note of the Wisconsinite's pioneering paper that a great deal of concluding space was consumed decrying the perceived social costs of gender difference claims, especially to women, rather than further illuminating or summarizing the data.

Del Giudice appears to find the issue of bias somewhat less motivating. If sex differences are small, he suggests, we have little to explain and more time to discuss incorrect stereotypes—"this is the main appeal of the GSH." He agrees that "ideology has played a part in the success of the GSH." Nonetheless, he maintains that the aforementioned "methodological limitations have played a larger role."

In his closing comments to me, the Californian echoed much of what Steven Pinker has so courageously recognized in recent years with regard to the broader subject of group divergences. The ongoing examination of sex differences in personality may or may not be tainted by feminism or other ideologies. But given the inquiry's great sensitivity and profound implications, Lippa's comments—crafted in the finest tradition of true skepticism—bear repeating here:

"I believe this is not a topic where 'ignorance is bliss.' We have to examine the nature of sex differences objectively. . . . We should, as researchers, be open to all possible explanations. And then, as a society, we have to decide whether we want to let the differences be whatever they may be, or work to reduce them."

Words to inquire by. So let the research into gender differences continue, as the Europeans urge, unfettered by irrelevant politics or pet, self-serving causes. I suspect we have little to fear. But let science characterize our differences objectively, whatever their nature and degree. Then, if necessary, we'll decide together—as an open and informed community—how best to cope with them. ■

Note

1. Two excellent books have recently reviewed the scientific and cultural particulars of "race" for a popular audience: Ian Tattersall and Rob De Salle's *Race? Debunking a Scientific Myth* (Texas A&M University Press, 2011) and *Race and the Genetic Revolution: Science, Myth, and Culture*, edited by Sheldon Krimsky and Kathleen Sloan (Columbia University Press, 2011).

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Dealing with Believers During Skeptical Investigation

Q: A friend of mine is getting into amateur ghost hunting, and he asked me, a skeptic, to join him on his investigations. I ordered your book *Scientific Paranormal Investigation* in preparation. Other ghost hunters are joining us, all of them believers as far as I know. Do you have any advice for skeptics dealing with believers in paranormal activities?

—Jack Sager

A: Dealing with believers is a big part of a paranormal investigator's job, and my general advice is to always treat them with courtesy and respect. Beyond that, how you deal with them depends largely on what role they have in the investigation—typically as either claimants or coinvestigators.

Believers as Claimants

Believers who actually saw the ghost, UFO, or other unexplained phenomenon should be treated primarily as eyewitnesses. They have information an investigator needs to understand the phenomenon and potentially solve the mystery, and there is no benefit to being anything but courteous and polite. Your job is to get as much information from them as possible and try to understand what they experienced—in other words, to establish the claim.

During investigations, you will be talking with people who are approaching the topic from a different point of view (or who are already convinced of the validity of only one interpretation of the event they experienced). Good investigation is about finding the facts and revealing the truth; it is not about attacking a person's intelligence, credibility, or motives. The question of whether an eyewitness truly saw a ghost is a factual issue, not a personal one. You must make a clear distinction between criticizing a person's logic or evidence and attacking him or her as a person.

Ridicule and mockery of sincere people has no place in skeptical paranormal investigation. Not only will it tarnish your reputation and that of other skeptical investigators, but it is counterproductive and will sabotage the investigation. With the rare exceptions of frauds and hoaxers, most people who experience and report paranormal phenomena are sincere, honest people who simply didn't understand something they experienced. Your job as an investigator is to understand and explain what happened to the best of your ability—not necessarily to convince the believer that you're right and they're wrong.

Believers as Coinvestigators

On the other hand, sometimes the believers are not making the original claim but instead are coinvestigators (not necessarily working together but at least in the same place at the same time). Ghost hunters are usually so busy anomaly hunting that they neglect (or forget) to address the original paranormal claims (see my recent "Skeptical Inquiree" column on anomaly hunting, May/June 2011).

I often encounter this scenario during TV shoots where producers have assembled a team mixed with believers and skeptics (usually in about a 10:1 ratio). Other times when I'm at a supposedly haunted location, less-skeptical ghost hunters are there doing their own thing. In these situations I'm typically doing two things at once. The main objective is, of course, trying to understand the original claims and solve the mystery. But the second goal is watching the other investigators to examine (and sometimes document) their methods. A lot of times watching others "investigate" teaches me how *not* to do it.

Criticizing their methods or gear (such as pointing to their blinking, beeping EMF detector and saying, "You know that doesn't really detect ghosts, right?") is unlikely to be productive. They have their own investigation techniques (usually copied directly from pseudoscientific TV shows like *Ghost Hunters*) and are rarely interested in a skeptic's perspective.

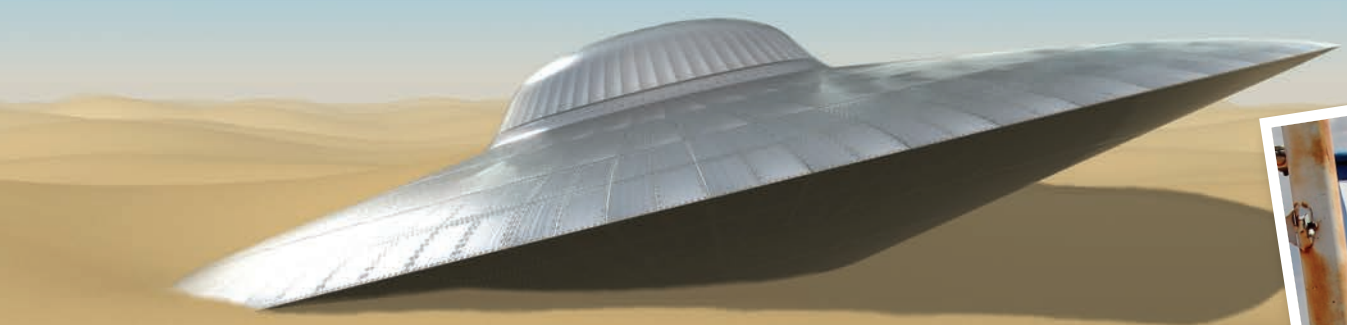
While I'm there it's not my job to teach the ghost hunters how to do their job (if they ask my advice, that's another thing). Now and then I'll ask polite questions about their premises and assumptions, but for the most part I don't challenge them at the time. I've actually had some really interesting, productive, respectful discussions with believing ghost hunters and psychics that have greatly helped me understand their worldviews and approaches.

It sounds like you can approach it from two routes: as an investigator or as an observer. The main difference is research and preparation: If you're going in as an investigator, you should research (and be fully prepared to investigate) the claims. If you're just going to watch what happens, that's a lot less work and can be both fun and funny. My advice is to enjoy the investigation, and if you're going to explain to your friend what he (or the other ghost hunters) are doing wrong, either wait until you're asked and respond diplomatically or bring it up later. ■

THE ROSWELLIAN

An analysis of four classic flying-saucer incidents reveals how debunking can send a mundane case underground, where it is transformed by mythologizing processes, then reemerges—like a virulent strain of a virus—as a vast conspiracy tale. Defined by the Roswell Incident (1947), this syndrome is repeated at Flatwoods (1952), Kecksburg (1965), and Rendlesham Forest (1980).

JOE NICKELL and JAMES MCGAHA



SYNDROME

HOW SOME UFO MYTHS DEVELOP

Near the very beginning of the modern UFO craze, in the summer of 1947, a crashed "flying disc" was reported to have been recovered near Roswell, New Mexico. However, it was soon identified as simply a weather balloon, whereupon the sensational story seemed to fade away. Actually, it went underground; after subsequent decades, it resurfaced as an incredible tale of extraterrestrial invasion and the government's attempt to cover up the awful truth. The media capitalized on "the Roswell incident," and conspiracy theorists, persons with confabulated memories, outright hoaxers, and others climbed aboard the bandwagon.

We identify this process—a UFO incident's occurring, being debunked, going underground, beginning the mythmaking processes, and reemerging as a conspiracy tale with ongoing mythologizing and media hype—as the Roswellian Syndrome. In the sections that follow, we describe the process as it occurred at Roswell and then demonstrate how the same syndrome developed from certain other famous UFO incidents: at Flatwoods, West Virginia (1952); Kecksburg, Pennsylvania (1965); and Rendlesham Forest (outside the Woodbridge NATO base) in England (1980). Between us, we have actually been on-site to investigate three of the four cases (Joe Nickell at Roswell and Flatwoods, and James McGaha—a former military pilot—at Rendlesham).

Roswell (1947)

Here is how the prototype of the Roswellian Syndrome began and developed:

Incident. On July 8, 1947, an eager but relatively inexperienced public information officer at Roswell Army Airfield issued a press release claiming a "flying disc" had been recovered from its crash site on an area ranch (Berlitz and Moore 1980; Korff 1997). The next day's *Roswell Daily Record* told how rancher "Mac" Brazel described (in a reporter's words) "a large area of bright wreckage" consisting of tinfoil, rubber strips, sticks, and other lightweight materials.

Debunking. Soon after these initial reports, the mysterious object was identified as a weather balloon. Although there appears to have been no attempt to deceive, the best evidence now indicates that the device was really a balloon array (the sticks and foiled paper being components of dangling box-kite–like radar reflectors) that had gone missing in flight from Project Mogul.

It is now known that Marcel made claims about his own background—that he had a college degree, was a World War II pilot who had received five air medals for shooting down enemy planes, and had himself been shot down—that were proved untrue by his own service file.

Mogul represented an attempt to use the airborne devices' instruments to monitor sonic emissions from Soviet nuclear tests. Joe Nickell has spoken about this with former Mogul Project scientist Charles B. Moore, who identified the wreckage from photographs as consistent with a lost Flight 4 Mogul array. (See also Thomas 1995; Saler et al. 1997; U.S. Air Force 1997.)

Submergence. With the report that the "flying disc" was only a balloon-borne device, the Roswell news story ended almost as abruptly as it had begun. However, the event would linger on in the fading and recreative memories of some of those involved, while in Roswell rumor and speculation continued to simmer just below the surface with UFO reports a part of the culture at large. In time, conspiracy-minded UFOlogists would arrive, asking leading questions and helping to spin a tale of crashed flying saucers and a government cover-up.

Mythologizing. This is the most complex part of the syndrome, beginning when the story goes underground and continuing after it reemerges, developing into an elaborate myth. It involves many factors, including exaggeration, faulty memory, folklore, and deliberate hoaxing.

For example, exaggeration played a large role in the Roswell case. Major Jesse Marcel, who had helped retrieve the wreckage, often made self-contradictory and inflated assertions, giving, for example, grossly exaggerated statements about the amount of debris, its supposed imperviousness to damage, and other matters. It is now known that Marcel made claims about his own background—that he had a college degree, was a World War II pilot who had received five air medals for shooting down enemy planes, and had himself been shot down—that were proved untrue by his own service file (Fitzgerald 2001, 511). Kal Korff (1997, 27), who uncovered many of Marcel's deceptions, found him "exaggerating things and repeatedly trying to 'write himself' into the history books." As he described the debris, Marcel said the sticks resembled balsa but were "not wood at all" and had "some sort of hieroglyphics on them that nobody could decipher" (apparently referring to the floral designs). As well, there were "small pieces of a metal like tinfoil, except that it wasn't tinfoil" (Berlitz and Moore 1980, 65).

Faulty memory was another problem. For example, Curry Holden, an anthropologist from Texas Tech, claimed a student archaeological expedition he led had actually come upon the crashed flying saucer and the bodies of its extraterrestrial crew. Holden's wife and daughter, however, insisted that he had never told *them* of such an event; neither was there any corroboration in his personal papers. Holden was ninety-six when he provided his account to UFOlogist Kevin Randle, at which time his wife told Randle her husband's memory "wasn't as sharp as it once had been. He sometimes restructured his life's events, moving them in time so that they were subtly changed" (Fitzgerald 2001, 514). Roswell mortician W. Glenn Dennis, who provided information on alien "bodies" at the Roswell AAF Hospital, also seriously misremembered and confabulated[1] events. According to James McAndrew's *The Roswell Report: Case Closed* (U.S. Air Force 1997, 78–79), Dennis's account "was compared with official records of the actual events he is believed to have described" and showed "extensive inaccuracies" that included "a likely error in the date by as much as twelve years."

The processes that create folklore also played a role in shaping the Roswell legend. As reported in Leonard Stringfield's book *Situation Red: The UFO Siege* (1977), a great

number of tales proliferated about an alleged crash of an extraterrestrial craft and the retrieval of its humanoid occupants. The many versions of the story—what folklorists call variants—are proof of the legend-making, oral-tradition process at work. The aliens were typically described as little, big-eyed, big-headed humanoids, a type that began to be popularly reported after they were described by "abductees" Betty and Barney Hill in 1961 (Nickell 2011, 184–86). The pickled corpses were secretly stored—mostly anonymous sources claimed—at a (nonexistent) hangar-18 at Wright Patterson Air Force Base in Dayton, Ohio, or some other location subsequently supposed to be Area 51 (the U.S. government's secret test facility). From a folkloristic point of view, the crash/retrieval stories seem to function as "belief tales," that is, legends told to give credence to a folk belief—in this instance a burgeoning one (Nickell 1995, 196–97).

Roswell folklore was obviously fed in part by deliberate fakelore. Related hoaxing began in 1949 when—as a part of the forthcoming sci-fi movie *The Flying Saucer* (1950)—an actor posing as an FBI agent avowed its claim of a captured spacecraft was true. In 1950, writer Frank Scully reported in his *Behind the Flying Saucers* that the U.S. government possessed three Venusian spaceships complete with humanoid corpses. Scully got his information from a pair of confidence men who were hoping to sell a petroleum-locating gadget allegedly derived from alien technology. By 1974, a man named Robert Spencer Carr was giving talks in which he claimed firsthand knowledge of where the preserved aliens were hidden; however, the late claimant's son reported that his father made up the entire yarn. Other Roswell hoaxes included the ineptly forged "MJ-12 documents" (that continue to fool UFOlogist Stanton T. Friedman); a diary that told how a family came upon the smoldering crashed saucer and injured aliens (but was written with an ink not manufactured until 1974); and the notorious "Alien Autopsy" film, showing the dissection of a rubbery extraterrestrial who appeared to be from the distant Planet Latex (Nickell 2001, 118–21).

Reemergence and Media Bandwagon Effect. In 1980 the story resurfaced in the media with publication of the book *The Roswell Incident*. Its authors were Charles Berlitz (who had previously written the mystery-mongering best seller *The Bermuda Triangle*, containing "invented details," exaggerations, and distortions [Randi 1995, 35]) and William L. Moore (who was a suspect in the previously mentioned "MJ-12" hoax [Nickell with Fischer, 1992, 81–105], as well as author of *The Philadelphia Experiment*, an expanded version of another's tale that itself proved to be a hoax [Clark 1998, 509]). *The Roswell Incident*'s book jacket gushed: "Reports indicate, before government censorship, that occupants and material from the wrecked ship were shuttled to a CIA high security area—and that there may have been a survivor!" It adds that ". . . Berlitz and Moore uncover astonishing information that indicates alien visitations may actually have happened—only to be hushed up in the interest of 'national security.'"

The book is replete with distortions. Consider rancher Mac Brazel's original description of the scattered debris he found on his ranch—strips of rubber, sticks, tinfoil, tough paper, and tape with floral designs (Nickell 2009, 10)—the same as shown in photos (U.S. Air Force 1997, 7) and consistent with a Mogul balloon array with radar reflectors. However, Berlitz and Moore impose a conspiratorial interpretation, saying that in a subsequent interview Brazel "had obviously gone to great pains to tell the newspaper people exactly what the Air Force had instructed him to say regarding how he had come to discover the wreckage and what it looked like." In fact, Brazel quite outspokenly insisted, "I am sure what I found was not any weather observation balloon," and he was right: the debris was from a Project Mogul array, much of it foiled paper from the radar targets (Berlitz and Moore 1980, 40).

Berlitz's and Moore's *The Roswell Incident* launched the modern wave of UFO crash/retrieval conspiracy beliefs, promoted by additional books (e.g., Friedman and Berliner 1992), television shows, and myriad other venues. Roswell conspiracy theories were off and running, typically linked to strongly anti–U.S. government attitudes. The Roswellian Syndrome would play out again and again.

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Flatwoods (1952)

About 7:15 PM on September 12, 1952, at the tiny village of Flatwoods, Braxton County, West Virginia, some boys on the school playground saw a fiery UFO apparently land on a hilltop. Running to a nearby home, they obtained a flashlight and were joined by a beautician, her two sons, and a dog. As the unlikely group went up the hill toward a pulsating light, one boy aimed a flashlight at a pair of eyes shining through the dark. The group saw a tall "manlike" entity with a round face surrounded by a "pointed hood-like shape." Suddenly the monster emitted a high-pitched hissing sound and swept at them with "a gliding motion as if afloat in midair," while exhibiting "terrible claws." The group ran in panic, and the next day skid marks and a black gunk were found at the site (Nickell 2000).

The incident attracted journalists, writers (like paranormalist Ivan Sanderson), and apparently two Air Force investigators in civilian clothes. Soon, the UFO was identified as a meteor; seen in three states, it had only *appeared* to land when it disappeared behind the hill. The pulsating light was obviously one of three airplane beacons in view at the site. The tall "monster" was believed to have been a large owl on a limb (since then, more evidentially determined to have been a barn owl [Nickell 2000]), and a local man identified the ground traces as caused by his pickup truck and its leaking oil pan. The case soon slipped into obscurity.

Fifteen years elapsed, then Sanderson included the case as Chapter 3 of his *Uninvited Visitors* (1967). The credulous Sanderson (once fooled by a rubber Sasquatch frozen in ice [Nickell 2011, 87–90]) opined that the Flatwoods incident involved multiple UFOs—citing contradictory accounts of, in each instance, a *single* object. Instead of suspecting that witnesses were mistaken or that the meteor might have broken apart, he insisted that "to be logical" we should believe that there was "a flight of aerial machines" that were "maneuvering in formation." For some reason they lost control, but one managed to land at Flatwoods. Its pilot emerged "in a space suit" but, observed, headed back to the craft, which—like two others that "crashed"—soon "vaporized" (Sanderson 1967, 37–52).

Sanderson was followed in 2004 by Frank C. Feschino Jr., who published—with an introduction and epilogue by Stanton T. Friedman—*The Braxton County Monster: The Cover-Up of the Flatwoods Monster Revealed*. Feschino interviewed elderly witnesses, who, according to the book's promotional copy, "wanted to talk about the story for the first time in fifty years." For example, Kathleen May, the beautician who was with the boys when they encountered the "monster" in 1952, recalled a mysterious "government" letter that had been shown her by local reporter A. Lee Stewart Jr. She claimed it told of experimental craft the "Navy Department" operated in the area the evening of the incident. Feschino huffs: "The test ship explanation told to Mrs. May in the mysterious letter was not even remotely possible in 1952. The Air Force knew that Mrs. May did not see a meteor in Flatwoods. So they convinced her that it was something explicable, like an experimental ship. But there were no experimental ships in 1952!" (Feschino 2004, 336). Actually, according to reporter Stewart, what he had shown May was only a press release for an issue of *Collier's* magazine with an attached photo of a moon ship (Feschino 2004, 323–36).

Kecksburg (1965)

About forty miles southeast of Pittsburgh, in Kecksburg, Pennsylvania, on December 9, 1965, a boy playing outdoors saw an object plummet into nearby woods. In fact, a brilliant aerial object had been seen by numerous observers over a large area. The *Greensburg Tribune-Review* reported in its county edition of December 10, "Unidentified Flying Object Falls Near Kecksburg" and "Army Ropes Off Area." However, that newspaper's city edition headlined its story "Searchers Fail To Find Object" (Gordon 2001, 288). From photographs of the cloud train from the object, *Sky & Telescope* magazine (February 1966) identified it as a very bright meteor (a type of fireball known as a bolide). The story went underground.

The Kecksburg incident remained obscure until September 19, 1990, when it became the season opener for NBC's *Unsolved Mysteries*. The show launched the story as one of a

crashed UFO, its secret retrieval, and a government conspiracy to hide the truth. Nearly a quarter of a century after the original incident, two local men had begun to claim that before authorities arrived they had entered the wooded area and encountered a large metallic object, shaped like an acorn, partially embedded in the earth. At the back of the object, the witnesses said, using wording that is curiously similar to that of the Roswell incident, were markings like ancient Egyptian "hieroglyphics." And, also like the Roswell case, the UFO was allegedly transported to Wright-Patterson Air Force Base near Dayton, Ohio, where it was kept in a sealed building (Gordon 2001, 288–90). Such shared motifs (as folklorists call story elements) suggest the Kecksburg incident was influenced by the Roswell story. One source even claimed bodies were recovered at Kecksburg but subsequently retracted the claim (Young 1997).

The various later claims do not fare well, and more than fifty residents of Kecksburg sent a petition to *Unsolved Mysteries* attempting to forestall the broadcast. These included the fire chief in 1965, Ed Myers, and a couple, Valerie and Jerome Miller, whose home the TV show wrongly claimed had served as a "military command post" during the UFO recovery. Actually, both the Air Force and the state police reported the day after the incident that nothing had been discovered and that all that had been carried from the site was search equipment (Young 1997).

Rendlesham Forest (1980)

For three days in late December 1980 in East England, a series of UFO close-encounter incidents occurred in Rendlesham Forest, located between two British NATO bases—RAF Bentwaters and RAF Woodbridge—that were at the time being leased by the United States Air Force. The incidents began in the early morning of December 26 (although sources disagree, some giving December 25 or December 27) and lasted for three successive days. Security patrolmen witnessed a bright streaking light that appeared to crash into the forest. Investigating, the men soon saw lights they attributed to a UFO—a bright white light plus an apparent vehicle with "a pulsing red light on top" and "blue lights underneath." As the patrolmen proceeded closer, the object "maneuvered through the trees and disappeared" (Halt 1981). The following day, three seven-inch-diameter depressions were found at the site. That night "burn marks" were seen on trees, and radiation readings were also obtained. On an audiotape made by Deputy Base Commander Lt. Col. Charles Halt that same night, one hears an unidentified person call out regarding the bright light, "There it is again . . . there it is," with a five-second interval ("Rendlesham" 2011). Later that night "three starlike objects" were seen in the sky; one to the south, Halt (1981) said, "was visible for two or three hours and beamed down a stream of light from time to time" (Butler et al. 1984; Ridpath 1986; Hesemann 2001).

As we now know, a bolide (a brilliant meteor) streaked over southern England at the time of the first Rendlesham sighting. Subsequently, the Suffolk police investigated the initial sighting and determined that the only light visible from the area was that of the Orford lighthouse (Ridpath 1986). The Orford Ness beacon stood in the very direction airmen were looking and flashed at the same five-second interval reported for the UFO. Later, other claims were convincingly debunked: the red and blue lights were from a police car; the "landing" depressions were rabbit diggings; "burn marks" on pines were axe blazings oozing resin; the low radiation readings had been taken with equipment not intended to measure background radiation and were therefore meaningless; and the starlike lights were probably indeed stars, namely Sirius, Vega, and Deneb ("Rendlesham" 2011; Ridpath 1986). Meanwhile, the Rendlesham story remained unpublicized for almost three years.

In October 1983 the story leaked out and made headlines in the British tabloid *News of the World:* "UFO Lands in Suffolk—and That's Official." It was followed by a book, *Sky Crash: A Cosmic Conspiracy* (1984), written by Brenda Butler, Jenny Randles, and Dot Street and based in part on hypnosis sessions with "Art Wallace"—actually former U.S. Airman Larry Warren who was the *News of the World*'s in-

Shared motifs (as folklorists call story elements) suggest the Kecksburg incident was influenced by the Roswell story. One source even claimed bodies were recovered at Kecksburg but subsequently retracted the claim.

formant. Warren's claim to have been a witness to the Rendlesham incident has been disputed by others, including Halt ("Rendlesham" 2011). By this time bizarre rumors had surfaced that a commander had met three little humanoid extraterrestrials who had emerged from the landed UFO, but the alleged contactee denied it (Butler et al. 1984, 86).

In time, Jenny Randles, who helped hype the Rendlesham incident, came to doubt the extraterrestrial connection, stating, "While some puzzles remain, we can probably say that no unearthly craft were seen in Rendlesham Forest. We can also argue with confidence that the main focus of the events was a series of misperceptions of everyday things encountered in less than everyday circumstances" (qtd. in "Rendlesham" 2011).

* * *

No doubt other instances of the Roswellian Syndrome could be given (even beyond UFO encounters), but the ones we have presented here are major examples of the type. Of course, each is different in its own way (for example, the Rendlesham Forest case had a much briefer period of submergence than did Roswell). And some famous UFO incidents—the Phoenix Lights of 1997, for instance (Davenport 2001)—have not followed the same course. (For one apparent reason, it did not involve a specific site on the ground visited by investigators.)

Nevertheless, we believe we have identified a genuine pattern in cases in which, during a period of submergence, the mythologizing tendency has been at work followed by a reemergence—rather like a new, more virulent strain of a virus. It appears that UFOlogists are always looking for a Holy Grail case to verify their belief in extraterrestrial visitation, and when that does not pan out (most UFO reports prove little more than misidentifications, ambiguous sightings, fake photos, and the like) they seek out the old cases and are rewarded with much more sensational testimony. By identifying and analyzing this process, we hope to promote more critical thinking regarding these and other sensationalized cases. ■

Acknowledgments

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Note

1. Confabulation is a distortion of memory in which gaps in one's recollection are unintentionally filled in with fictional experiences (Goldenson 1970, I: 249).

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The Trouble with Pseudoskepticism

The continuing rejection of anthropogenic global warming by nonexperts despite overwhelming scientific consensus is rationally untenable and best described as "pseudoskeptical." It is akin to AIDS denialism, advocacy of intelligent design, and anti-vaccination movements.

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Whatever else might be argued about the nature of science, genuine scientific research inherently involves skeptical rigor. Discrete scientific disciplines approach topics of study in ways unique to the discipline's methodological needs. A paleoclimatologist cannot conduct her investigations in the same manner that a pharmacological chemist working in a laboratory will conduct hers. Nevertheless, science does have at least one reliable component: the skeptical analysis of data. To be studied scientifically, a hypothesis must be testable. In other words, science, regardless of its particular field, is a fundamentally skeptical endeavor involving the testing of hypotheses coupled with efforts to protect test results from confounding variables, including the researchers' own biases. The integrally skeptical nature of science is most evident in the fact that science advances through efforts to disprove hypotheses, even when hope is held for their confirmation. This is described well by philosopher Karl Popper:

> The point is that, whenever we propose a solution to a problem, we ought to try as hard as we can to overthrow our solution, rather than defend it. Few of us, unfortunately, practice this precept; but other people, fortunately, will supply the criticism for us if we fail to supply it ourselves. Yet criticism will be fruitful only if we state our problem as clearly as we can and put our solution in a sufficiently definite form—a form in which it can be critically discussed. (Popper [1959] 2002, xix)

When a pseudoscientist lacking expertise in a particular scientific domain makes a show of openly contradicting well-established claims of scientific consensus, as is often the case with so-called "alternative medicine," the pseudoskeptical component of pseudoscience is made manifest.

The efforts Popper describes are reflected in standard scientific practices, such as repeated and controlled experimentation, the publication of findings only after peer-reviewed critique, and the requirement that such findings be presented openly so that other researchers may attempt to replicate and independently confirm or reject them under the same rigorous constraints. Indeed, all of this is a necessary prerequisite for any findings to take on a meaningful level of scientific acceptance, let alone consensus. A scientific theory becomes accepted as such only once the laws observed, findings predicted, and facts organized under that proposed theory have been so rigorously tested and confirmed over time that it becomes highly implausible (if nevertheless logically possible) that the stated theory should ever be refuted. Any scientific theory as a whole will represent the accumulated and organized explanatory force of numerous repeatedly tested data points. Thus skeptical critique is necessarily and inextricably part and parcel of the scientific process.

Global warming pseudoskepticism is on the rise in the industrialized nations most responsible for climate change.

However, as contrasted with science, the most evident characteristic of pseudoscience is its utter credulity—indeed its dependence on credulity as a methodological aspect of investigation. Simply put, while scientists are busy attempting to disprove a favored hypothesis and guarding themselves against the ever-present danger of confirmation bias, pseudoscientists actively seek confirming evidence for what they have already deemed to be the case. This is so even for pseudoscientists who eagerly attempt to appear skeptical. Paranormal investigators of the pseudoscientific stripe provide excellent examples of this pretense. To call oneself a "paranormal investigator" (as opposed to an investigator of paranormal claims *à la* Joe Nickell) is to already confess a belief that there is something paranormal to investigate; the pursuit itself begs the essential question.

We do not fault the biologist for her well-warranted and uncontroversial belief in biological life, but we very well can fault the paranormal investigator for so eagerly believing in the paranormal. Yet pseudoscientists strive to appear skeptical, perhaps in part to win for themselves some of the mandate or regard many people reserve for genuine skepticism. In their attempts at wearing the garb of skepticism, pseudoscientists often assert the shortcomings, failures, or dangers of some given well-established scientific consensus. When a pseudoscientist lacking expertise in a particular scientific domain makes a show of openly contradicting well-established claims of scientific consensus, as is often the case with so-called "alternative medicine," the pseudoskeptical component of pseudoscience is made manifest.

The word *pseudoskepticism* was coined by the late sociologist and founding member of CSICOP (now CSI) Marcello Truzzi. The term, as originally used by Truzzi, is meant to identify a failure among self-identified skeptics to remain in the face of extraordinary or supernatural claims. Truzzi's concern was that skeptics not abandon reasonable agnosticism in favor of a dismissive cynicism. Instead, Truzzi would have us remain true to the spirit of scientific inquiry by proportioning our beliefs to the strength of evidence available. And when there is no supporting evidence available for a claim, Truzzi would have us call that claim unwarranted, rather than disproven (Truzzi 1987).

Since it was introduced by Truzzi, the term *pseudoskepticism* has commonly been misused by promoters of the paranormal (and offended magical thinkers) as an ad hominem repudiation of their

scientifically minded critics. Perhaps because of this misappropriation, the term has failed to play a prominent role in the skeptic's lexicon. This is unfortunate, because it is a useful term; there is no compelling justification for associating it exclusively with the obstinate denial of paranormal claims.[1] Dogmatic rejection of reliable evidence, regardless of what that evidence supports, is always misguided.

Of course, given the nature of most paranormal claims, and certainly those of the supernatural variety, it is improbable if not impossible that sufficient scientific evidence could ever be gathered to justify warranted assertion. To admit this is not a sign of pseudoskepticism as Truzzi promoted the term but rather recognition that some types of claims, even if true, are beyond the scope of what can be scientifically supported. In contrast, pseudoskeptical cynicism is on display whenever nonexperts dogmatically deny the scientific explanations held in consensus by legitimate experts—for *pseudoskepticism* is precisely the skeptical artifice used by pseudoscientists when marching in parade against the alleged oppression or conspiracy of mainstream science.

Since scientific consensus is reached through the organized skepticism inherent to the scientific process, the term pseudoskepticism is most appropriately identified as the negligent and unwarranted denial of established scientific consensus.

Thus, for the sake of clarity and application, I want to reconvene Truzzi's useful designation and expand upon the concept of pseudoskepticism to include that well-known pseudointellectual performance that involves the rejection of assertions already firmly established through the rigorous scientific process. Pseudoskepticism is a form of cynicism posturing as skepticism. It is fatuously premised on the assumption that doubt for doubt's sake is inherently rational—call this the "cynic's fallacy." Such is obviously not the case when there is strong

When mainstream science—such as the efficacy and importance of vaccination—comes under pseudoscientists' criticism, pseudoskeptical cynicism is on display.

supporting evidence in favor of a given claim. This form of cynicism tends to generate hostility toward scientific consensus or a misunderstanding of what is entailed in such consensus.

Of course, this is not to argue that one cannot legitimately question scientific consensus; indeed, without constant testing and questioning, science would be in danger of stagnation. Scientific inquiry flourishes in the context of open intellectual contest, as evidenced by its skeptical nature.[2] In scientific endeavors, a consensus only exists because all attempts to discount a given claim have instead served to strengthen the evidence for it. Pseudoskepticism, alternatively, can be understood in relation to three propositions put forth by Bertrand Russell in "On the Value of Skepticism" ([1928] 2005). As Russell puts it:

> There are matters about which those who have investigated them are agreed; the dates of eclipses may serve as an illustration. There are other matters about which experts are not agreed. Even when the experts all agree, they may well be mistaken. Einstein's view as to the magnitude of the deflection of light by gravitation would have been rejected by all experts not many years ago, yet it proved to be right. Nevertheless the opinion of experts, when it is unanimous, must be accepted by non-experts as more likely to be right than the opposite opinion. The scepticism that I advocate amounts only to this: (1) that when the experts are agreed, the opposite opinion cannot be held to be certain; (2) that when they are not agreed, no opinion can be regarded as certain by a non-expert; and (3) that when they all hold that no sufficient grounds for a positive opinion exist, the ordinary man would do well to suspend his judgment.

The identification of pseudoskepticism is consistent with Russell's insights regarding the value of expertise. Whenever those outside the realm of active research into a particular topic willfully and without justification contradict established scientific consensus on that topic, they are acting as pseudoskeptics. Thus pseudoskepticism is most often, if not always, displayed by those who lack expertise in a particular field and therefore most reasonably ought to proportion their belief to the accepted scientific consensus, when such consensus exists.

Accordingly, when experts hold a consensus, skepticism or denial of that

consensus on the part of laypersons is unreasonable and is therefore properly identified as pseudoskepticism. After asserting his skeptical propositions, Russell goes on to argue that if these simple propositions were to be accepted, they would have positive, even revolutionary implications for human life. Russell therewith suggests that his skeptical principles have certain moral and social implications. I submit that agreeing with Russell in this regard requires only minimum reflection upon the ethical responsibilities attached to inquiry and on the harms that threaten society when superstitious and pseudoskeptical thinking are accepted as the status quo.

Prime examples of pseudoskepticism and its dangers are found in AIDS denialism, anti-vaccination advocacy, and—perhaps most prominently in our current political mainstream—the denialism of anthropogenic global warming. It is worth dwelling on the latter form of pseudoskepticism for a moment, for global warming pseudoskepticism is on the rise in the industrialized nations most responsible for climate change.[3] At the same time, those who are most vulnerable to climate change are those least responsible for it and least able to adapt to it. As such, the moral hazard involved in this form of pseudoskepticism compounds its global dangers. Much can be said about the scientific facts of global warming, and all of it is available for anyone who wants to put the effort into learning those facts.[4] Rather than rehearsing the facts here, I want to focus on the reasonableness of sticking with expert consensus, when such consensus exists, as the most practical method of avoiding pseudoskepticism.

Regularly, in the course of teaching critical thinking to college students, I find that when informal logical fallacies are first encountered at the conceptual level, students tend to see them everywhere—like a kind of ideological pareidolia. However, as I tell my students, an informal fallacy is a fallacy because of what is not presented with it: namely well-reasoned arguments, precise definitions, and supportive evidence. It is not the case, as Russell points out so effectively, that every appeal to expertise ought to be considered a fallacious appeal to authority. This is not to say that experts cannot be wrong, but it is always more reasonable to appeal to an expert than a nonexpert when one lacks appropriate expertise. It stands to reason that the more experts agree on a particular topic, the more cause there is for nonexperts to defer to their consensus.[5]

Prime examples of pseudoskepticism and its dangers are found in AIDS denialism, anti-vaccination advocacy, and—perhaps most prominently in our current political mainstream—the denialism of anthropogenic global warming.

Now again, in the case of well-established scientific consensus like the one regarding anthropogenic global warming, the denial of expert opinion by nonexperts is pseudoskeptical. It is therefore a misleading folly for us to agree to call global warming deniers "skeptics" or to blithely ignore this designation of their denialism in the popular media or elsewhere. Skepticism implies the critical analysis that is the hallmark of science, and skepticism is precisely what has established the overwhelming consensus among working climatologists for anthropogenic global warming. To deny the legitimacy of this consensus while claiming to be a "skeptic" would require an unjustified double standard regarding one's appreciation of the scientific process. Global warming denialism is no longer a tenable position to be held by those who consider themselves to be rational skeptics.

Predictably and increasingly, the denial of anthropogenic global warming is taking on the hallmark trappings of pseudoscience, including conspiratorial claims about climatology and climatologists, irrelevant appeals to nature ("if it is consistent with natural cycles, then it is not a threat"), truly fallacious appeals to authority, the elevation of dissenters to romantic levels of heroism, and the unwillingness to proportion belief to rationally considered evidence. To call such obdurate denialism "skepticism" is a gross misnomer that undermines science as well as the potency of genuine skepticism. It is high time the skeptical community as a whole call out global warming denialism for the pugnacious pseudoskepticism that it is, and that we attack it with the same gusto and critical savvy heretofore reserved for intelligent design proponents and anti-vaccination quacks.[6]

Notes

1. The concept of false skepticism is occasionally applied more usefully, and still consistently with Truzzi's use of "pseudoskepticism," against those who support dubious forms of denialism on dogmatic or ideological grounds (as is the case, for example, with AIDS denialism). (These are the same dubious forms of denialism identified in this essay.) See especially Richard Cameron Wilson's article "Against the Evidence" (online at www.newstatesman.com/ideas/2008/09/evidence-sceptic-hiv-bogus) as well as his book *Don't Get Fooled Again* (2008). I maintain, with Wilson, that pseudoskepticism is most often a product of ideological motivation rather than of balanced inquiry. Beyond embracing the dogmatism of ideology, the pseudoskeptic can be identified by a misguided, cynical, and fallacious "doubt for doubt's sake." However, my emphasis is exclusively on the denialism of well-established scientific consensus,

because that type of denialism occurs outside of the legitimate scientific process. I place emphasis on such denialism again here, as I have elsewhere (see Torcello 2011), in order to provide a more consistent criterion by which to identify pseudoskepticism and in order to attach moral culpability to it in the context of political discourse.

2. In the course of normal scientific investigation, a scientific consensus may be challenged by researchers actively investigating the relevant topic; however, the burden is upon the researchers to demonstrate their alternative hypothesis within the standard parameters of the scientific process (i.e., empirical research, peer-review, repeated independent replication by other researchers, etc.). To be clear, doubt of established consensus in so far as it plays a role in legitimate research guided by the scientific process is not pseudoskeptical, but ignoring established scientific consensus is pseudoskeptical.

3. Much of the increasing pseudoskepticism regarding global warming is attributable to a well-organized, and well-documented, campaign against legitimate climate science on the part of corporate polluters—and politicians under the financial influence of such corporate interests. See George Monbiot's *Heat: How to Stop the Planet from Burning* (2007) and Chris Mooney's *The Republican War on Science* (2007).

4. A good place to begin learning about anthropogenic global warming is by turning to the Intergovernmental Panel on Climate Change, which was created to serve as an authoritative source for disseminating information on the scientific findings regarding climate change (www.ipcc.ch/). Another extremely valuable source, and perhaps even more valuable than the IPCC reports for those who are just beginning to learn about the science of climate change research, is the website RealClimate: Climate Science from Climate Scientists (www.realclimate.org/index. php/archives /2007/05/start-here/). Another informative source is the website Skeptical Science: Getting Skeptical about Global Warming Skepticism (www.skepticalscience.com/). I would prefer, for obvious reasons, if the subtitle read "Getting Skeptical about Global Warming Pseudoskepticism." Finally, the National Center for Science Education (http://ncse.com/climate) has made the defense of climate science a part of its mandate, a move that ought to be applauded widely by all advocates of science and skepticism.

5. Massimo Pigliucci provides a very useful discussion of expertise and how to sort through expertise, along with an important exploration of how politics can thwart the public's proper understanding of science in cases like climate change in his recent *Nonsense on Stilts: How to Tell Science from Bunk* (2010).

6. Elsewhere, I have argued for an ethical duty among academics, politicians, and journalists to publicly confront and counter pseudoskeptical claims against scientific consensus when such claims are made in the context of public policy debates. (See Torcello 2011.)

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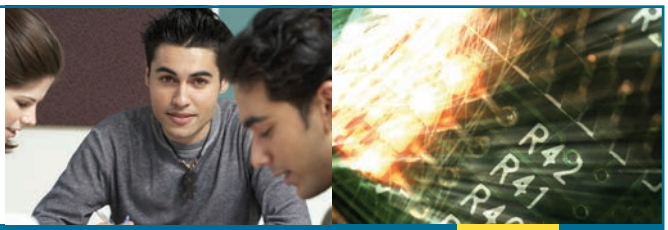

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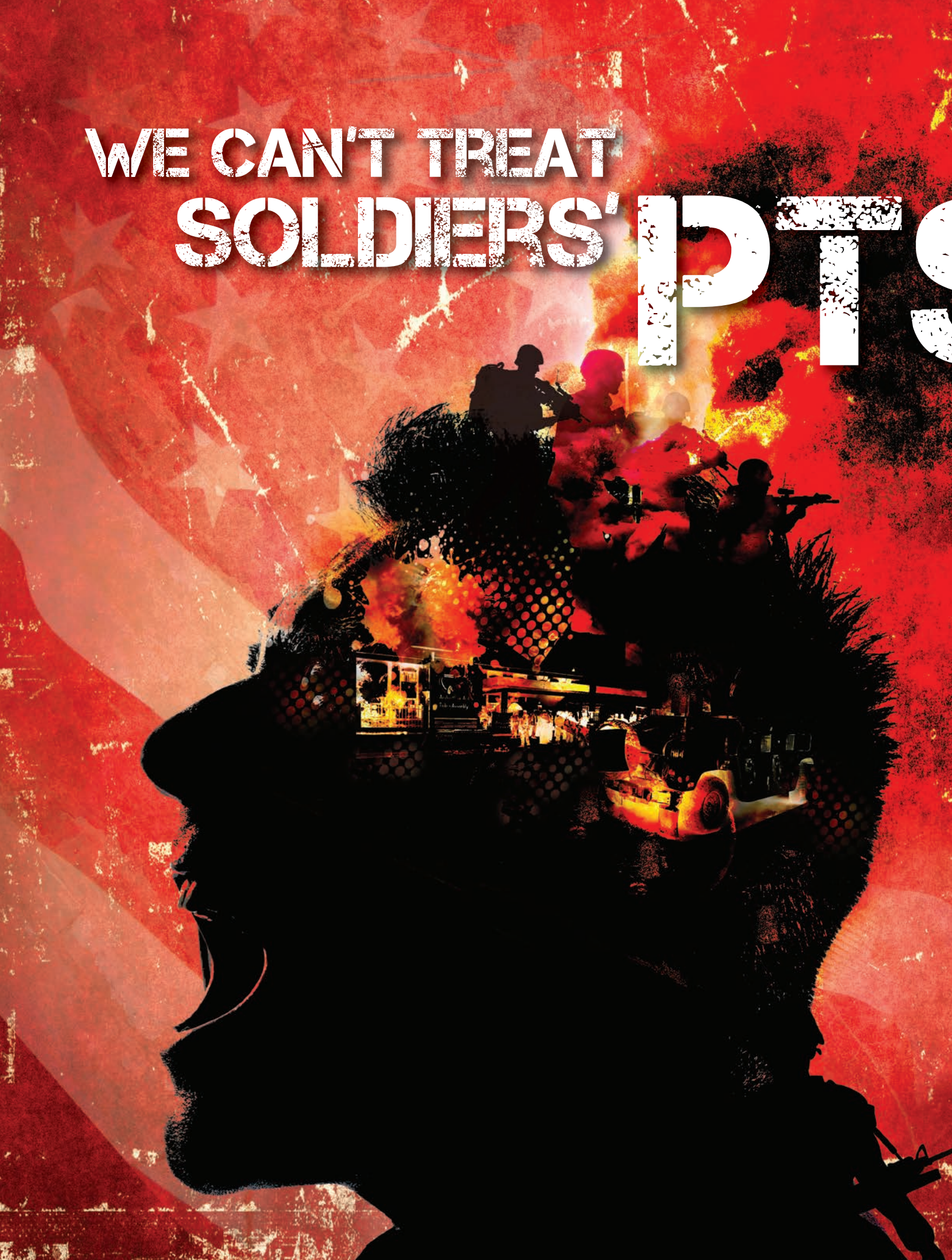
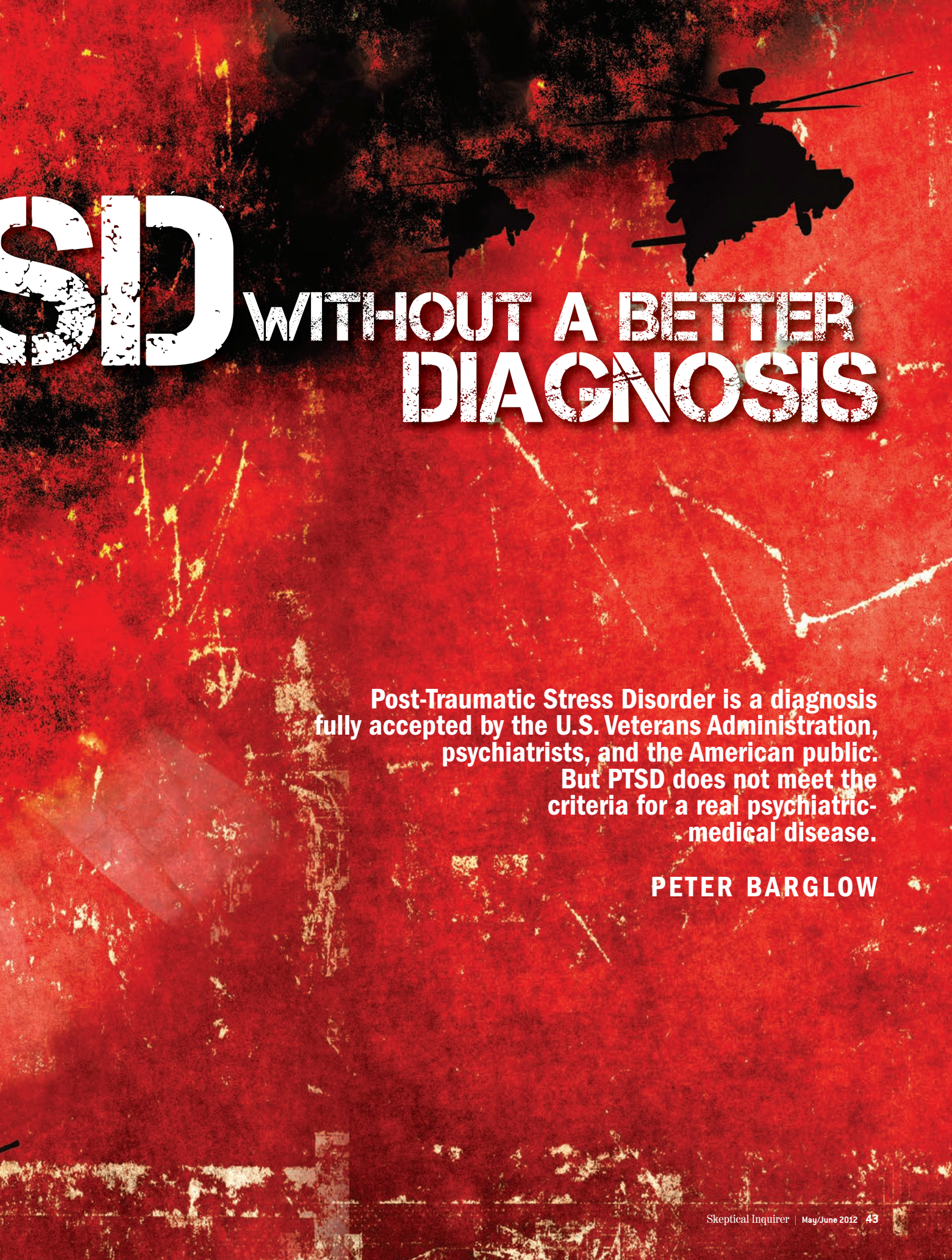

WE CAN'T TREAT
SOLDIERS' PTS



PTSD WITHOUT A BETTER DIAGNOSIS

Post-Traumatic Stress Disorder is a diagnosis fully accepted by the U.S. Veterans Administration, psychiatrists, and the American public. But PTSD does not meet the criteria for a real psychiatric-medical disease.

PETER BARGLOW

Since 1980 Post-Traumatic Stress Disorder (PTSD) has been a major mental illness category of the American Psychiatric Association's (APA) *Diagnostic and Statistical Manual of Mental Disorders* (DSM). In this article I critically examine the use of this diagnosis to treat soldiers suffering from the aftermath of physical and emotional war trauma. The term *PTSD*, referring to a psychiatric disease or disorder, appeared in the *New York Times* 19,000 times in the ten years between August 14, 2000, and August 15, 2010, compared to only 450 times during the prior twenty years.

Today, 400,000 war veterans obtain financial assistance for this medical condition. Of two million Iraq and Afghanistan veterans, 10 percent are estimated to have PTSD. It is the topic of hundreds of psychiatric and psychology articles per year and absorbs large annual national expenditures for treatment and research. Out of $3.8 billion awarded as a result of U.S. Congressional funding bill HR2638 to the U.S. Veterans Administration (VA) in 2009 for mental illness, the single largest mental disease category funded was PTSD. Between 2004 and 2009, 20 percent of the estimated half a million Iraq-Afghanistan war veteran patients were treated for PTSD. The first year of this health care cost was 1.4 billion dollars (U.S. Congressional Budget Office 2012). How did it come about that the diagnosis of PTSD became so widely accepted by the Veterans Health System (VHA), the American Psychiatric Association, and the American public?

This question first was raised in my mind when two decades ago I did a psychiatric evaluation of a fifty-year-old Vietnam veteran, a Purple Heart recipient with a voluminous official history of treatment for PTSD. A few weeks earlier he had threatened to kill both himself and his therapist in her office at a VA outpatient psychiatric clinic. He was disabled by use of a Taser gun by police, who had stormed the building.

They seized him while he was unconscious, and transported him to a prison. The patient was an unemployed married Hispanic man, wounded during the war's Tet offensive. His record indicated that he had suffered for many years from PTSD symptoms such as hyper-arousal, insomnia with nightmares about Viet Cong snipers, and paranoid fears; these increased during binges of alcohol use. I had anticipated a confrontation with a huge, menacing figure but found the man to be a mild-mannered little guy who resembled Woody Allen. He said that he had noted none of the above PTSD symptoms for many months, but he was deeply concerned about retaining maximum VA compensation for this diagnosis.

My surprise at the apparent cure of this former soldier's mental disease prompted me to review several dozen medical-psychiatric records of Vietnam veterans diagnosed with PTSD by me or other VA and military psychiatrists. I also reinterviewed over a dozen patients. PTSD symptoms listed in DSM-IV are memory loss or distressing flashbacks referring to battle events, hyper-vigilance, poor sleep with recurrent nightmares, irritability, startles, and episodes of emotional numbness. (This last symptom appears to be the single most important one in verifying the PTSD diagnosis [Pietrzak 2009].) The current APA diagnosis requires appearance of characteristic symptoms after a latency period of time subsequent to a specific severe precipitating traumatic event—constituting "Criterion A," discussed below.

Several patients also shared with me considerable discomfort with the label of PTSD, which to them signified an emasculating weakness or dishonesty rather than a genuine illness. A search for financial benefits did appear to be one important factor in shaping the narratives of both patients and clinicians. This suggested the advantages for veterans ("secondary gain") of reporting typical PTSD symptoms, but it also reflected compassion of VA evaluating staff toward patients who clearly had suffered severely during and after warfare. The record review showed considerable co-morbidity (when a disease category overlaps with one or more other major psychiatric diagnoses, such as Major Depressive Disorder or Acute Stress Disorder), and many of the patients used addicting drugs (alcohol, marijuana, pain killers, or amphetamine stimulants). Substance dependence was almost impossible to disentangle from PTSD symptoms.

Unlike my patient whom I described earlier, few veterans with PTSD improved very much during the many years that had elapsed since their initial clinical assessment. Often DSM-IV clinical criteria for PTSD had been

Several patients . . . shared with me considerable discomfort with the label of PTSD, which to them signified an emasculating weakness or dishonesty rather than a genuine illness.

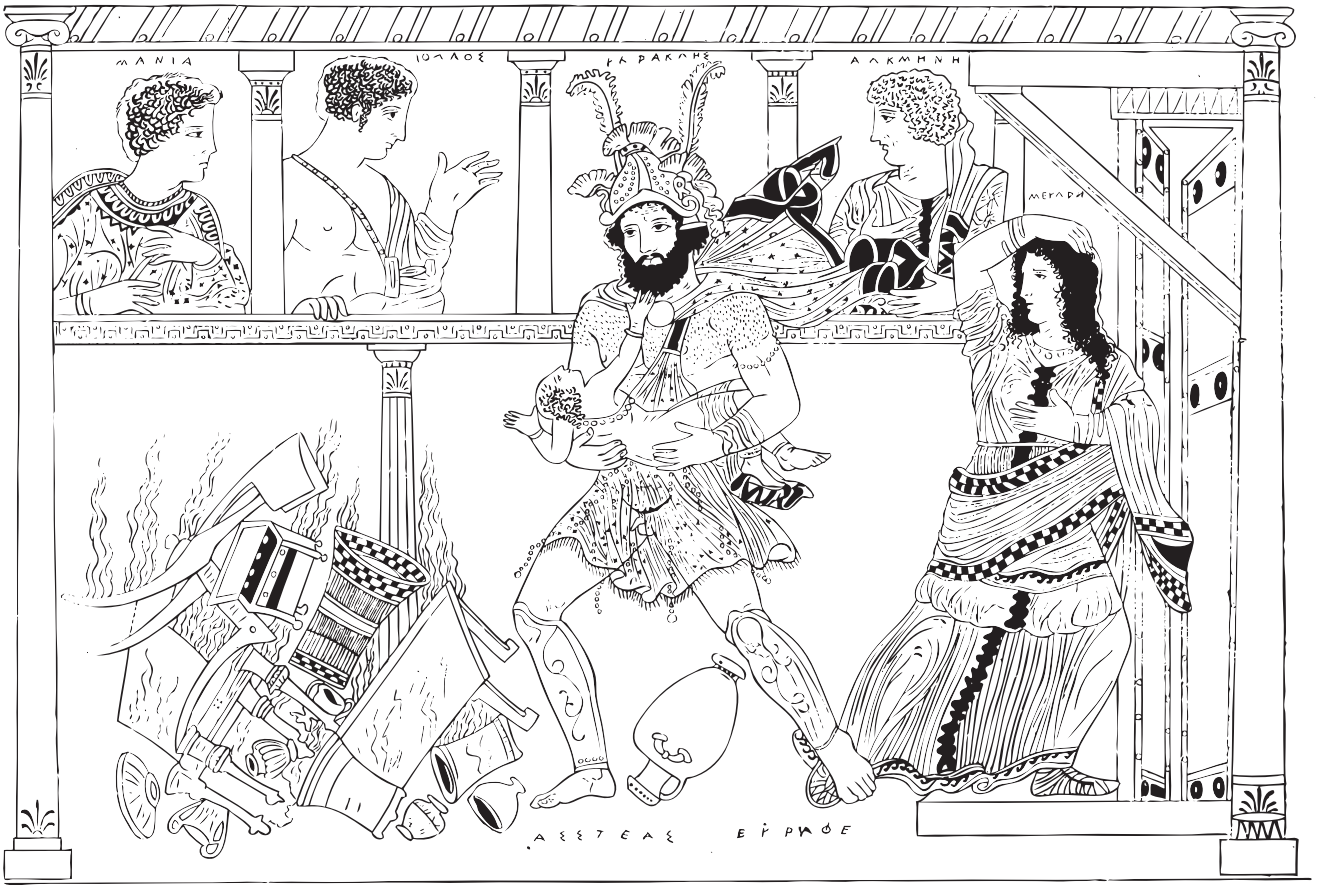
carelessly applied to veterans whose post-war lives had been dominated by poverty, unemployment, homelessness, and family disruptions because of violence, drugs, or divorce.

A Brief History of PTSD

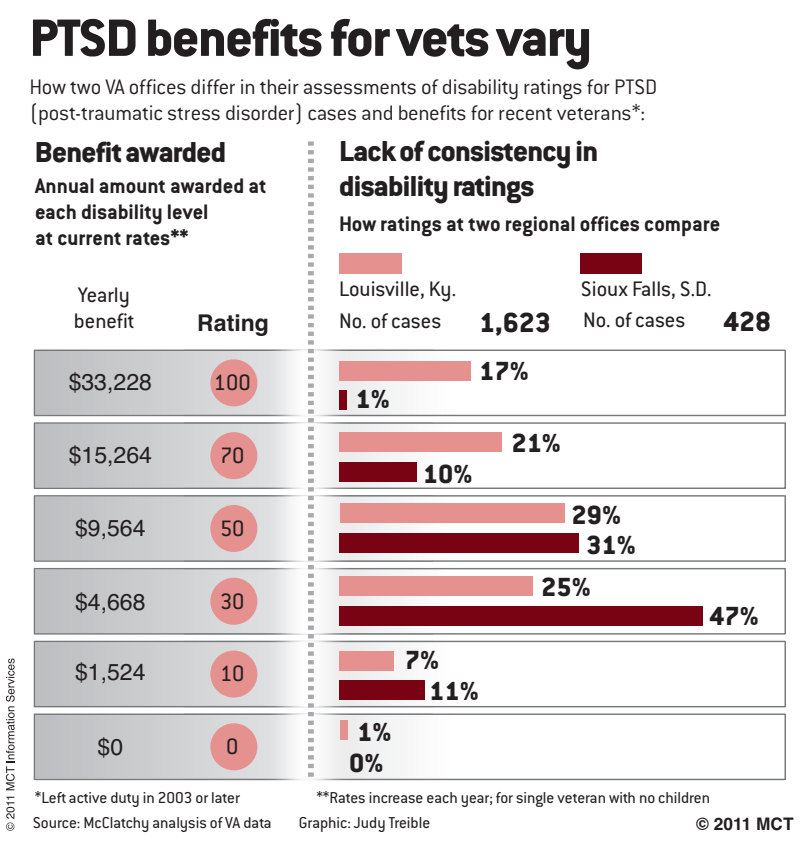
The DSM classification system was created in 1952. Its first two editions (I [1952] and II [1968]) were based upon Freud's psychoanalytic formulations. The etiology of mental disorders was thought to originate in early-life traumatic experiences. However, a major change in thinking about the concept of a mental disorder and its etiology occurred in the 1970s, reflected in DSM-III (1980). There was a marked shift away from attention to early childhood histories. Valiant attempts were made to mimic mainstream medicine and surgery using their ancient etiological categories—trauma, cancer producing, infectious, toxic, degenerative, genetic, metabolic, and endocrine.

But psychiatric disorders proved difficult to classify with quantifiable chemical findings or specific identifying clinical signs. The revised DSM systems (in an effort to establish reliable guidelines for diagnosticians) still had to rely substantially upon self-reported descriptions of symptoms, not on measurable data. DSM I–III systems' categorical decisions reflected literature reviews, some data analysis, periodic field trials, and the outcome of verbal debates between experts. That complex decision-making process used patients' clinical information but had to rely upon fallible doctors' judgments. A better approach to diagnosis creation was clearly needed, and so psychiatric research in the early 1990s was increasingly devoted to the human brain.

PTSD was first listed in the 1980 edition of the APA's *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III) and modified later in DSM-IV and DSM-IV-TR. Its appearance in the official APA nomenclature followed years of intense lobbying effort by Vietnam veterans' organizations, activist social workers, psychologists, and anti-war psychiatrists. Advocates for the PTSD diagnosis asserted that traumatic memories of war experiences were being revived in contemporary time, producing a new serious mental illness. Soldiers should be treated and compensated for



A 1889 line drawing of the Greek hero Herakles, afflicted with something akin to PTSD brought on by the violence of his twelve labors, by the artist August Baumeister. It originates in a Greek-Sicilian vase painting signed by the artist Asteas (350–320 BCE), depicting a theater performance in which the Herakles of the dramatist Euripides is about to immolate the first of his three children while his wife attempts to escape his psychotic wrath.



a disorder attributable to events that took place many years earlier. This understanding necessitated a shift in attention away from the psychodynamics of individual veterans, and other risk variables, to a heavy emphasis upon a single major factor—the negative aftereffects of war trauma on later mental health.

The leaders of the American psychiatric profession who became midwives to the official birth of PTSD during the 1970s shared today's almost universal belief that large-scale suffering of others matters universally and that it demands to be recognized and ameliorated. This moral value probably accounted for the diagnostic inclusion of Criterion A, which has generated heated debate since its original inclusion in the 1980 DSM-III. Criterion A for PTSD states that a patient diagnosed with PTSD was confronted with "events that involved actual or threatened death or serious injury. . ." and responded with "intense fear, helplessness, or horror." Criterion A made PTSD the only DSM mental disorder that required a subjective appraisal of an external environmental stressor as part of its diagnosis. Retention of the trauma criterion has been supported by the observation that studies of symptoms unconnected to a specific precipitant have failed to identify any "characteristic set of symptoms" (North et al. 2009). Also this position is consistent with the conclusion that treatment concentrating on specific trauma memories and their meaning is more effective than nontrauma-focused therapy (Ehlers et al. 2010).

But the criterion does have many problems. One statistical piece of evidence against inclusion of documentation of a quantitative trigger to facilitate making a diagnosis is that most soldiers do not develop an anxiety disorder or any major psychiatric disorder even when exposed to the most horrific trauma. The widespread application of Criterion A ignores vast individual variations in patients' resilience and capacity to adapt. Its reliance upon subjective reports rather than objective eyewitness evidence further weakens its scientific status. For the preceding reasons, Criterion A does not appear in the PTSD diagnosis category of the International Classification of Mental Diseases (ICD-10).

The importance of this diagnostic criterion in determining the size of disability benefits for veterans with PTSD has been diminished by new VA standards issued by the Obama administration in 2010. The VA policy now states that VA psychiatrists need not require proof of the quantitative impact of a traumatic precipitant. This VA policy change was inspired by a deep concern for the suffering of victims and largely ignored the APA's PTSD Criterion A, which may be deleted from DSM-V's definition.

Does PTSD Meet the Criteria for a Valid Psychiatric Diagnosis?

The diagnosis of PTSD has always had many critics, ranging from McHugh and Treisman (2007), who boldly consider PTSD to be a "faddish postulate" that "creates a medical condition out of normal distress," to the meticulous scholars Rosen and Lilienfeld (2007), who concluded that the disorder's "core assumptions and hypothesized mechanisms lack compelling or consistent empirical support." Robins and Guze (1970) proposed five research areas in which a psychiatric diagnosis might be validated: (1) clinical description including precipitants and diagnostic stability over time; (2) biological, hormonal, and radiological quantitative evidence; (3) distinct boundaries between the disorder's characteristics and other psychiatric conditions; (4) family or genetic statistical connections between patients in the diagnostic category; (5) treatment relevance and success related to precise diagnosis. Schizophrenia, major depression, and alcohol dependence are examples of mental disorders that have achieved considerable legitimacy through this process, but PTSD as a diagnosis for war veterans has not yet attained comparable validity.

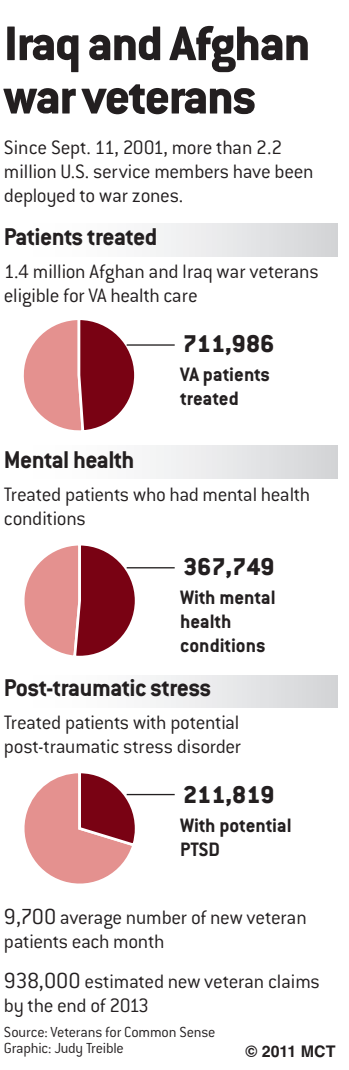
The above five research domains constitute fertile ground for further re-examining PTSD's diagnostic weaknesses and generating potential remedies:

Clinical Description and Precipitants. The VA patient I described earlier is an example of diagnostic instability. The weakness of Criterion A suggests a problematic relation between PTSD and specific precipitants. These days it is obvious that patients suffering from the emotional aftermath of warfare have not demonstrated consistent symptom patterns. Perhaps, then, we can better comprehend the emotional toll of recent American wars by applying the sociological concept that throughout history powerful professional and political communities have constructed truth, established definitions, and generated rules for the interpretation of trauma's impact. This viewpoint provides insight into the history of emotional war trauma and explains its massively varying conceptualizations and manifestations. Like "Historical Critical Psychopathology" (Baldwin et al. 2004), it emphasizes"historically situated and contingent aspects of mental disorders."

Using such a framework of understanding, the earliest PTSD portrayal may be the fourth-century character Herakles, created by the dramatist Euripides. Driven insane by a Greek goddess, he suffered a transitory murderous frenzy precipitated by the violence of his twelve labors. A messenger inquires of him, "Has the blood of the men you recently killed driven you out of your wits?" Over two millennia later, emotional victims of American Civil War trauma were said to be afflicted with "Soldier's Heart" (1864–1868), and those suffering from "Railway Spine" in America (circa 1886) showed psychological and physical characteristics quite different from those used currently to identify PTSD. Such patients in the latter half of the nineteenth century experienced bodily shaking and tremors of arms and legs, stuttering, and limping, but they did not report anger, numbing sensations, or flashback symptoms as contemporary PTSD victims often do.

Civil War victims' clinical presentations resembled those reported during the Russo-Japanese War (1904–1905), when emotional casualties began to be treated with considerable respect. Many Russian psychiatrists argued that afflicted soldiers had a "real illness." English and German "shell shock" victims and Russian "contusion" casualties during World War I (1914–1918) also demonstrated a quite different symptom constellation from that characteristic of PTSD in twenty-first-century America. European patients manifested multiple sensory-motor signs such as deafness, muteness, and blindness. Such striking historical dissimilarities in the psychological clinical phenomena of post-war emotional syndromes suggest they resemble cultural constructions more than disease categories. Cultural factors may also influence treatment outcome; PTSD victims in Kenya found help in their religious community, in contrast to Oklahoma City bombing survivors who received benefit from medical treatments (North 2009).

Brain Structure and Neurophysiologic Studies. Since DSM-IV appeared in 1994, there has been a massive increase in U.S. research efforts to demonstrate that an organic central nervous system disturbance causes PTSD. This campaign was named "embodiment" by skeptics who deplored the use of inappropriate comparison groups and the contaminating role of "cultural expectancy" in the studies mobilized to create a more precise and useful PTSD diagnostic category (Baldwin et al. 2004). The search for organic brain changes as the source of PTSD symptoms was fueled by the belief that war's emotional stress could affect brain physiology and chemistry negatively, producing permanent and characteristic post-trauma symptom patterns. The first major effort to argue this position originated during the 1905 Russo-Japanese war through studies of soldiers who suffered from "contusion," a puzzling nervous breakdown during or after combat. The psychology versus brain change etiological debate became even more active during World War I (1914–1918) in Europe with research about "shell shock."


Iraq and Afghan war veterans
Since Sept. 11, 2001, more than 2.2 million U.S. service members have been deployed to war zones.
Patients treated
1.4 million Afghan and Iraq war veterans eligible for VA health care
711,986
VA patients treated
Mental health
Treated patients who had mental health conditions
367,749
With mental health conditions
Post-traumatic stress
Treated patients with potential post-traumatic stress disorder
211,819
With potential PTSD
9,700 average number of new veteran patients each month
938,000 estimated new veteran claims by the end of 2013
Source: Veterans for Common Sense
Graphic: Judy Treible
© 2011 MCT

Since the Korean War (1950–1953), multiple research efforts in English-speaking countries have sought distinct patterns of psycho-physiological arousal in PTSD. But measurements of neurotransmitter levels across most populations with the disease showed marked differences of quantity, including a complete failure to show heightened responses in a quarter of cases. Acute stress has been shown to activate the central nervous system to release catecholamines, norepinephrine and epinephrine, into the bloodstream. But patients with acute PTSD symptoms have normal plasma concentrations of these substances. Only those with chronic PTSD have increased cerebrospinal fluid norepinephrine levels that correlate with the severity of PTSD symptoms. But all sit-

uations that produce stress for human primates—not just emotional war trauma—are associated with catecholamine release.

Malfunction of the hypothalamus-pituitary-adrenal hormonal axis has been postulated in those PTSD victims who have lowered blood cortisol levels and who demonstrate enhanced cortisol suppression with dexamethasone and exaggerated cortisol secretion during stressful exposure. But findings have been inconsistent or subtle, and many hormonal studies lack hormone level data pre-exposure to stress. Recent prospective longitudinal studies have shown that low cortisol levels in PTSD patients may actually have preceded, not followed, a traumatic event. Finally, cortisol levels vary dramatically secondary to numerous biological, temporal, and psychological variables, making them an unreliable biological marker.

Another major effort to find a neurobiological correlate to PTSD has focused upon brain morphology studied through brain scanning. Extrapolating from animal stress models, it was suggested that elevated corticosteroids (adrenocorticotropic hormone, or cortisol) in patients with PTSD could produce toxic damage to the hippocampus. The function of memory is thought to reside there, and the structure's compromise might be related to flashbacks and nightmare symptoms. But there is only weak evidence for this link in humans. Also, most human studies have failed to control for other psychiatric disorders associated with hippocampal atrophy, including alcoholism. Smaller hippocampal volume is a relatively nonspecific finding that also has been reported to be associated with depression and even borderline personality disorder. Statistical associations between emotional war trauma, PTSD, and size of brain structures remain highly speculative and unproven.

PTSD Boundaries with Other Psychiatric Disorders. The diagnosis of PTSD today is made by the use of standardized tests, such as the self-report PTSD Symptoms Checklist, the Clinician Administered PTSD Scale, and a Clinical Interview for DSM Disorders. But still, PTSD is poorly separated from other major psychological disorders, and its diagnostic stability is low, as illustrated by my patient vignette in the introduction of this article. Using current diagnostic criteria, PTSD has consistently been found to overlap other major psychiatric disorders. Kessler et al. (1996) found that 88 percent of a large sample of U.S. patients with PTSD met DSM-III or IV clinical-case data criteria for at least one other major mental disorder, most often chemical dependence. PTSD does have convergent validity with major depressive disorder (95 percent lifetime and 50 percent co-occurring) in combat veterans. Further research on the centrality of "numbing" may help establish PTSD as an independent diagnostic entity (Pietrzak 2009).

The medical condition traumatic brain injury (TBI) is also difficult to distinguish from PTSD. TBI is a brain concussion caused by a blow to the head that changes a soldier's consciousness, resulting in amnesia and neurological abnormalities. TBI can result from damage sustained from bullets, bombs, falls, or vehicle accidents. TBIs may be conceptually related to the above historical concepts of English "shell shock" and Russian "contusion" traumata.

Statistical associations between emotional war trauma, PTSD, and size of brain structures remain highly speculative and unproven.

Genetic Studies Related to Emotional Consequences of Battle Trauma. Such research remains suggestive rather than convincing. Molecular genetics has yet to identify specific genes that confer a vulnerability to PTSD. Although genetic research does support a biological component of PTSD, it has failed to distinguish it from other related (comorbid) psychiatric diagnoses. One study showed that shared genetics accounted for 30 percent of the variance in PTSD symptoms in Vietnam War veteran twins, even after taking into account different levels of combat exposure. Stein et al. (2002) proved in 1999 that genetics contributes to both the tendency for a subject to be exposed to traumas involving assault and a vulnerability to develop PTSD after exposure. Such results have led to the theory that a combination of genes and environment are necessary to develop PTSD symptoms, a proposal that contradicts the assumption that trauma is the core etiological agent. The preceding observations are consistent with the idea that PTSD may be distinguishable from other common disorders.

The PTSD Diagnosis Used to Guide Treatment of the Illness. Experts today do not yet know if the prolonged emotional suffering following physical or emotional war trauma can be ameliorated, let alone cured. The Institute of Medicine carefully evaluated fifty-three drug studies and thirty-seven psychotherapy studies (National Academy of Sciences 2008). Their team of academic specialists examined the evidence (or lack of evidence) for the success of anticonvulsants, benzodiazepines, MAOIs, SSRIs and other antidepressants, and other remedies such as Eye Movement Desensitization and Reprocessing (EMDR). Their summary concluded that there was insufficient scientific evidence to determine that any treatment (except possibly Prolonged Exposure Therapy)

had beneficial long-term effects for PTSD. Their report noted that drug manufacturers had funded many studies, possibly biasing their outcomes, and that too many research patients had dropped out of experiments to allow robust conclusions about efficacy. Little is known about what kind of patients benefit from which treatments.

On April 26, 2010, the *New York Times* published an article that described the plight of veterans who were physical and emotional casualties, slated for discharge, temporarily hospitalized at Fort Carson's Warrior Transition Battalion unit. Inmates and their close family members depicted absent or poor psychiatric treatment, overmedication, bureaucratic delays, and prescription of drugs that fostered addiction to heroin. Polypharmacy treatment for PTSD (combining anti-anxiety, antidepressant, antipsychotic, and anti-insomnia agents) recently has been associated with accidental death in U.S. veterans with this condition (*New York Times*, February 14, 2011). Such reports are painful reminders that neither the U.S. military establishment nor the Veterans Administration has learned quite enough to treat victims of emotional war trauma effectively.

"Prolonged Exposure Therapy," originated and proven efficacious by Edna Foa, remains the most evidence-supported successful intervention. It helps traumatized soldiers to approach trauma-related thoughts, feelings, and situations previously avoided because they cause distress. The technique uses education, breathing exercises, safe re-exposure to painful avoided or unavoidable war experiences, and "talking through" a patient's individual history of trauma. A couple of my own PTSD patients who tried this method felt that it reawakened and reactivated traumatic memories that appeared to have been forgotten, making their emotional distress even worse. This possible disadvantage for a portion of the war-traumatized population may be comparable to the reaction that some alcoholic addicts have experienced during Alcoholics Anonymous meetings. The explicit sharing with others of vivid experiences associated with the ravages of the disease stimulates them to drink right after a seemingly successful meeting. Also evidence for effectiveness of exposure therapy is not as strong for veterans as it is for civilians.

Recent empirical research studies indicate that cognitive processing therapy (CPT) is also often effective in treating the emotional aftermath of warfare. The method tries to modify perceptions of a specific war trauma and its reproduction.

Conclusions

Currently there is little benefit in directing treatment interventions toward patients diagnosed with PTSD, an amorphous disease category with indistinct conceptual boundaries and without a firm biological foundation. Money might be more prudently spent on immediate post-trauma intervention addressing individual patients' symptoms. Treatment of concurrent depression, addiction, and other anxiety conditions may be far more valuable than targeting chronic symptoms and decades-later psychological aftermaths. All approaches must ameliorate veterans' social conditions—poverty, homelessness, and marital and familial friction. Acute post-traumatic symptoms must not be transformed into a chronic compensated disability, set in stone by its designation as an official major DSM disease syndrome.

The use of the PTSD diagnosis may contribute to treatment failures because it fabricates a spurious invalid category of illness, rather than seeing a unique sufferer. A humane society must compensate and reward all military victims with generosity, but strict application of Criterion A of the PTSD diagnosis does not accomplish this purpose. PTSD appears to be more of a social construction than a medical brain disease, and as of this date can best be considered "as encompassing a broad range of possible reactions to adverse events" (Rosen and Lilienfeld 2007, 858). Finally, the stigma associated with this diagnosis of a mental illness may keep some veterans from seeking care. The shortcomings of the current PTSD diagnosis jeopardize the treatment of the terrible aftermath of war's emotional trauma. ■

Acknowledgment

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The Ongoing Decline of Religion

The inexorably growing impact of science is our most significant tool discrediting religion.

ELIE A. SHNEOUR

The Roman Catholic Church's remarkably concise statement of its core beliefs, the Credo, includes this pivotal article of faith that sustains and justifies most religions: "*Et exspecto resurrectionem mortuorum et vitam venture seaculi*"—"[I believe] and await the resurrection of the dead and the life of the world to come." Surely, life on Earth was truly miserable for nearly everybody until fairly recently. Through the ages the promise of comfort and immortality after earthly demise has been a powerful incentive for religious adhesion. In fact, failure to belong *in toto* to the Church, for example, was harshly punished by the ecclesiastical Roman Inquisition tribunal (1542–1908), which dealt out severe questioning that included torture to coerce the victim to recant and return to the fold. Those judged guilty of heresy incurred harsh penalties including death by fire.

There remain in the world today several other orthodoxies, led by religious fanatics, that torture and kill in the name of religion. Some of them use animal and human sacrificial rituals. On the other hand, to have one's virtual ticket to heaven punched one must pay for the privilege granted religion by exacting a number of conditions in return. They include strict adherence to specific rules of conduct and financial sacrifices by the willing believer. By contrast, the wicked (comprising those born or raised outside the faith, unbelievers, nonbelievers, cheats, murderers, thieves, and the like) are likely to be condemned to eternal damnation, which usually involves a hellish existence in some underground sea of eternal flames ruled by the Devil. The miscreant's fall from grace, however, need not be fatal if he or she recants the behavior in time. He or she may yet be pardoned by taking on burdensome obligations for the remission of sins. This is how religions have dominated mankind since time immemorial. They offer a collective vision of a benevolent eternity for the price of remaining an integral, potent part of human society. But today, life on Earth is more rapidly becoming gratifying while the possibility for a supernatural life after death is becoming increasingly problematic and distant.

The cornerstone of almost all established religions rests on ancient texts claimed to have been divinely inspired, although an argument can be made that all of them qualify as heavenly hearsay. Many have been translated into the common spoken and written language. They include the Septuagint, an early translation of the Hebrew Old Testament into Greek. Then there is the Complutensian Polyglot, the Old and New Testament of the King James Bible rendered in quintessential English, the Ramayana, the Bhagavad Gita as part of the Mahabarata, the Book of Mormon and the Pearl of Great Price, the Koran and the Hadith, the Torah and the wisdoms of the Midrash with the Babylonian and the Jerusalem Talmuds. These texts are usually grounded on a set of archaic dogmas, implausible beliefs, and fallacious precepts, such as the golden tablets as one of the divine sources for the Book of Mormon.

These texts inevitably clash against the coherent, rational, scientific advances that increasingly overwhelm religious histories, dictates, and dogmas. In all seriousness, some advanced religions still dispense such improbable yarns as a naked Eve in the Garden of Eden speaking with a snake. They allege the immaculate conception of Jesus by Mary through the intervention of the Holy Ghost. They assert that the Red Sea parted to allow Jews dry passage from Egypt to the Holy Land. More generally, these religions have been generating miraculous happenstances for which reliable evidence is never likely to be found.

For the rational person, it is increasingly difficult to accept these religious tenets. Indeed, to belong to most religions one must suspend wholesale monumental disbeliefs of the modern world and instead accept supernatural magical explanations. With scientific advances expanding the human view of the universe, it is understandable why so few major religions have emerged in the past thousand years. Given these wide-ranging impediments, it is not surprising that religions in almost all their forms are neither willing to deal with the modern world nor capable of doing so. This explains, in part, why the attendance at churches, synagogues, and mosques for religious events is slowly but palpably decreasing. Religions over

In all seriousness, some advanced religions still dispense such improbable yarns as a naked Eve in the Garden of Eden speaking with a snake.

the longer term seem doomed to eventual irrelevance. They appear to be well on the way to eventually turning into mere historical curiosities, but that will not happen effortlessly or soon because religions still carry considerable sway in the world.

Among the active religions of today, Judaism is one of the oldest and is conspicuous for its remarkable survival in the face of brutal existential assaults. Judaism covers a gamut of conflicting factions, many of which are based on fierce resistance to change. The scholars of old wrote many religious texts by borrowing liberally from other mythological traditions. For example, the four-thousand-year-old Babylonian Epic of Gamesh originated the story of a heavily animal-laden ark enduring a torrential rainfall and then ending up stuck on a mountain top. The Roman Catholic Church was eventually divided as a result of the sixteenth-century Reformation into Protestant denominations, which in turn were still further divided. Islam emerged from the dictates of the prophet Muhammad, who preached an uncompromising form of monotheism in the seventh century. Although there is a theoretical Islamic underpinning of belonging to a single community, Islam also fragmented early into a number of sects, some of which continue to fight each other in a murderous frenzy to this day. Hinduism emerged from bloody sacrificial cults brought in by Arian invaders in India around 1500 BCE. Buddhism began as a revolt in the sixth century BCE against orthodox Hinduism through the influence of Siddhartha Gautama, universally known as Buddha. Confucius in China did not preach the existence of a deity but of a mandatory system of good conduct that he introduced 2,500 years ago. Jainism was also introduced in the sixth century BCE, as yet another religion that taught nonviolence in revolt against Hinduism. Shinto in Japan was once a sect with reverence for *Kami*, a polytheist sacred power that eventually became distorted in order to sustain the brutal militarism of the 1930s and early 1940s—but its origins are lost in the early folklore of the country.

The central conclusion about religion has to be that it has not made any lasting impact on human ethics, the primary engine for its existence. In this respect alone, religion has failed dismally, as the world remains today at the uneasy threshold of a worldwide nuclear threat, looking helplessly at the hecatomb that was the twentieth century.

The central conclusion about religion has to be that it has not made any lasting impact on human ethics, the primary engine for its existence.

The single most significant element discrediting religion is the inexorably growing impact of science. That process began in earnest in sixteenth-century Europe and received a dramatic boost that had far-reaching implications not only for science but for the Roman Catholic Church as well. It was Copernicus (1473–1543) who mathematically dethroned Earth as the center of the Ptolemaic universe and postulated a heliostatic solar system, degrading the Earth to a much lesser position in the firmament. His work was confirmed by Galileo (1564–1642), who not only experimentally confirmed and supported the heliocentric theory developed by Copernicus but is actually considered the pioneer of the experimental method. This did not sit well with the Roman Catholic Church of the time, and stern opposition to Galileo's heliocentric system by the Church did not fully end until 1922. Now the Church has issued restrictions to human reproduction and stem cell research. Many other religions also have concerns about where scientific research is going and the risk it is posing to their beliefs. In the long run these restrictions are not likely to be effective. There can be no doubt that science will eventually triumph.

What makes the advance of scientific work possible is that there is an easy and fruitful give and take between science and technology; neither of these can possibly have an intrinsic fruitful relationship with religion. There is a major difference between science and technology: science is a way of thinking while technology is a way of doing. Technology provides no clear contribution to the eventual doom of religion because it dwells on an entirely different logical platform from science. That difference between them is important. Technology is an altogether distinct concept from science, although these two terms are almost always used interchangeably and indiscriminately. The extraordinary example is China, which was a veritable fountainhead of major technological inventions. These included the compass in the third century BCE and the development of medicine—the use of the pulse for diagnosis was recorded in the remarkable *Book of Titles*, dating back to the eleventh century BCE. Gunpowder was first used for fireworks in the second century BCE; writing paper was available from 105 CE onward, and printing with movable type was developed in the seventh century CE.

These were truly remarkable technological fruits of the human mind that Europeans didn't recognize and adopt until much later. Not surprisingly, there is no whiff of religious chicanery in them because religion is blinded by "having the word" that transcends scientific thoughts and technological pursuits, intentionally resisting change to protect its wobbly edifice of dogma. This is what makes every attempt to reconcile religion with science and/or technology a virtually unattainable goal.

One of my sometime mentors was paleontologist and Jesuit priest Pierre

Teilhard de Chardin (1881–1955). We encountered each other in France, where I lived, and later on in New York, where he died. He tried but failed to convince me to consider a Jesuit framework for my life, but I learned the catechism in the interim and sang until fairly recently exquisite masses and requiems by a variety of composers—from Gregorian chants and early music to contemporaries—in a number of churches and secular venues. Much of that music is awesomely beautiful in the main, but it neither subverted me nor provided me with a coherent convergence between religion, science, and technology, just as Pierre was unable to do so. This discouragingly futile effort to achieve consistency between science and religion is broadly ongoing today. A dominant factor is individuals' repeated but failed attempts to seek at least a rational link between religion and ethics. Ethics is a major factor in science but plays no discernible role in technology. Ethics consists of wise guides for human behavior that are vitally important to civilizing pursuits. They ensure the survival and prosperity of the human society. By contrast, religious precepts and prohibitions usually impose a hostile burden on outsiders and infidels who reject adherence to traditional and ancient norms, most of which long ago reached obsolescence.

It was Voltaire (1694–1778) who exclaimed in disgust as he left one of many interminable religious disputations of his time, "There are no sects in geometry!" By contrast, here is one shining example among many that illuminates how science and technology complement each other to advance both: In 1928 Karl Jansky, a newly minted MIT graduate engineer, was hired by the then-prestigious Bell Telephone Laboratories. He was assigned the difficult task of tracking down all sources of noise that interfered with telephone communications. By 1931 Jansky had systematically detected and identified all sources of telephonic noise, with one glaring exception. It took him many additional months to finally pinpoint that finicky last source of noisy interference. It originates in deep space from the direction of Sagittarius, located at the center of our own galaxy. Although Jansky published the results of his seminal work, he perplexingly didn't follow through on it but went on to do other things. It fell to an amateur astronomer, Grote Beber, to pursue this spatial mystery further; thus was born the science of radio astronomy, emerging as it did from technology rather than from science. Such fortuities are the bread and butter of science and technology, where no quarter is ever taken or given to claims that are beyond the realm of rational inquiry.

The one central position that distinguishes science and technology from religion is the tradition of unrelenting attempts to falsify the observations before they are accepted by the community of scientists and engineers, a demanding standard that religion could never accomplish or even consider. Religion is incapable of granting believers the thought that there may perhaps be errors in its tenets that might contradict any part of the platform on which they stand.

Nonetheless, religion has to rationalize its usually convoluted dogmas by giving them ethical dimensions—as already noted, an ultimately futile exercise. For example, the "Right to Life" has long been a dead letter in the Roman Catholic Church. Even Vatican scholars of the Scriptures no longer uphold the erroneous reading of Genesis 38:9. Among the Ten Commandments "Thou shalt not kill" does not even begin to encompass all human lifeforms, and the human construct is open to wide interpretation; consider the resulting dogma that "life begins at conception." That is an utterly false assertion on its face because spermatozoa and ova cells are vibrantly alive long before they meet. Life most assuredly does not begin at conception. There are no discontinuities here as life just persists and inexorably continues and matures. Thus the inevitable conclusion embraced by religion is that the sacred status of an individual and his society is dependent on properties possessed by human cellular tissues.

This has a startling consequence that is rarely if ever invoked by religion. Indeed, if all forms of human life were truly recognized as sacred down to the unicellular form, religious authorities would be compelled to insist on the ceremonial burial of every human cell, every strand of hair, every bit of skin, and every tissue removed from surgery. From the formal religious assertion of the sublime value of a single fertilized human cell, we are, alas, left with a preposterous notion that is not enforceable in the real world. Sooner rather than later these concepts will determine at some point in the future that all human life is sacred in fact as it is in theory. The quoted Roman Catholic Credo dogma that begins this essay is based on the proposition that life on Earth is assumed to be unlikely to improve and will remain irretrievably miserable. Only in life after death can one be granted perpetual solace in one of several forms. This precept has no place in science or technology, but it still finds a declining refuge in religion. The ultimate contradiction is the pro-lifer who supports the death penalty. H. L. Mencken witheringly summarized how science could overcome the limitations of theology and autocracy: "Every time the scientists take another fort from the theologians and the politicians there is genuine human progress." ■

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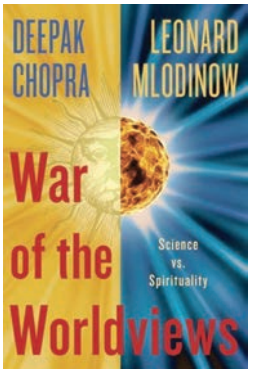
Is Science the Antidote to Deepak Chopra's Spirituality?

MARK ALFORD



War of the Worldviews: Science vs. Spirituality. By Deepak Chopra and Leonard Mlodinow. Harmony Books (Random House), New York, 2012. ISBN: 978-0307886880. 306 pp. Hardcover, $26.

Can skeptics and scientists learn anything from reading a Deepak Chopra book? In this case I think they can. It helps that this book is coauthored with Leonard Mlodinow, physicist, screenwriter, and coauthor with Stephen Hawking of the best seller *The Grand Design*. (He also received the Committee for Skeptical Inquiry's Balles Prize for his book on randomness, *The Drunkard's Walk*.) The book is formatted as a debate, each author setting out his side and responding to the other. It covers all the big questions: cosmology, life and evolution, the mind and brain, and God. Chopra advocates his own brand of spirituality, claiming that the universe is conscious and evolving. He presents his spirituality as the reasonable alternative to the soulless materialism of his critics. Mlodinow acts as the spokesman for science, countering Chopra's expansive claims and giving very clear explanations of conventional scientific knowledge.

The title invites us to read the book as documenting a struggle between science and spirituality, but Chopra clearly loves science and vies with Mlodinow to explain topics like the history of the cosmos and the role of DNA. In some cases Chopra misstates the content of scientific knowledge and Mlodinow corrects him, but in many cases Chopra and Mlodinow agree on the content of our scientific knowledge of the world.

Their disagreement is over a question that is not itself scientific: What deep truth does science tell us about the world? Does it tell us that there is a universal consciousness that we can access by going to a special place where it will be "drawn to your side" (Chopra, p. 251)? Or does it tell us that understanding one's essence means "to think of myself as a biological machine governed by the same laws that govern Pluto" (Mlodinow, p. 133)? This is a difference of two worldviews, but they are both metaphysical extensions of what science itself tells us.

The proper skeptical answer, I would argue, is a third view: "none of the above." Science *doesn't* tell us deep truths about the world. Chopra goes beyond science in one direction, using it as a springboard to launch his inspirational metaphysics. In his statement quoted above, Mlodinow jumps in another direction by espousing "philosophical" materialism, which, as Chopra says, is also a form of metaphysics. The skeptic rejects both spiritualistic and materialistic metaphysics. We don't have evidence that there is a universal consciousness with which we can commune, nor does science tell us the "essence" of anything.

From this point of view, the crucial division is not a battle line between science and spirituality but rather a different line, more like a geographical boundary, that separates science from metaphysics. Mlodinow steps over this line when he argues against Chopra's metaphysical castle-building by offering a competing metaphysical picture that says "No, the evolution of the universe isn't guided by a universal consciousness: it evolves through physical law, and has no guiding purpose" (p. 62). The problem with this is that it goes beyond what science tells us. Science does not measure the amount of purpose in the universe. I found myself agreeing with Chopra when he described such claims as philosophical materialism. By representing metaphysical overstatements as being part of the "scientific worldview," one puts real science in danger of being discredited. The proper "scientific" response to Chopra's spiritualistic metaphysics is to confine oneself to Laplace's admirably minimal comment, "We have no need of that hypothesis."

To be fair to Mlodinow, his metaphysical overstatements are much rarer than those of other popular writers such as Richard Dawkins. At various

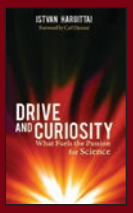
points in the book, he clearly states the limits of science. He acknowledges that "science does not address the meaning of life . . . and science will never be able to explain why the universe follows laws" (p. 256). Concerning the soul, he says that science does not claim to have proved that there is no such thing, only that there is no credible evidence for it (p. 131). He nicely summarizes the role of science as follows: "When [a] particular belief does not lead to conflict with what we observe in the physical world, there is nothing *science* says to oppose it," (my emphasis). The crucial point, which he doesn't state explicitly, is that there may indeed be arguments against it, but rather than being scientific they will be of a more general logical or philosophical nature.

Chopra's central claim provides an immediate example. What he advocates is a form of panpsychism, the proposition that mind is a fundamental feature of the world and exists throughout the universe. There is a lively ongoing debate concerning panpsychism, not among scientists but among philosophers. Reputable figures such as Galen Strawson and Timothy Sprigge argue in favor of panpsychism, though not anything like Chopra's ornate version, while others such as John Searle and Colin McGinn refute it (see "Panpsychism," *The Stanford Encyclopedia of Philosophy*, Fall 2010 edition).

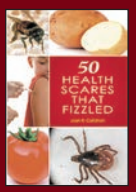
Chopra and Mlodinow's book is a wide-ranging and stimulating read. The presence of two perspectives, of an insider and of an outsider, gives stereoscopic depth to the explanations of the science. But by framing the debate as "science vs. spirituality," I think the book blurs an essential point. The counterpoint to Chopra's speculations is not science, with its complicated structure of facts, theories, and hypotheses, but something much more basic. The antidote to Chopra is Occam. ■

Mark Alford is professor of physics at Washington University in St. Louis. His 2011 debate with Deepak Chopra and others on "The Nature of Reality" was written up in the SKEPTICAL INQUIRER (May/June 2011) and can be viewed online at http://tinyurl.com/7qf5c4v.

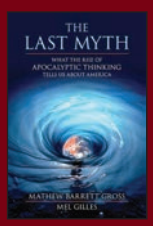
[NEW AND NOTABLE *Listing does not preclude future review.*



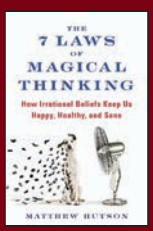
DRIVE AND CURIOSITY: What Fuels the Passion for Science. Istvan Hargittai. Foreward by Carl Djerassi. A physical chemist and writer examines the careers of fifteen eminent scientists who have made some of the most notable discoveries of the past century and uncovers in each case a singular personality characteristic, motivating factor, or circumstance that, in addition to their extraordinary drive and curiosity, led these individuals to make their discoveries. Prometheus Books, 2011, 338 pp., $26.



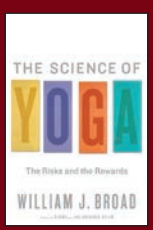
50 HEALTH SCARES THAT FIZZLED. Joan R. Callahan. Interesting and comprehensive review of failed health scares from a zoologist and epidemiologist, including AIDS, Ebola, MSG, power lines, and killer bees. ABC-CLIO, 2011, 360 pp., $85.



THE LAST MYTH: What the Rise of Apocalyptic Thinking Tells Us about America. Mathew Barrett Gross and Mel Gilles. An exploration of the origin and meaning of apocalyptic thought in America today, from belief by the Christian Right in the imminent occurrence of events foretold in Revelation to nonreligious worries about peak oil, global warming, and the end of civilization as we know it. Prometheus Books, 2011, 255 pp., $18.

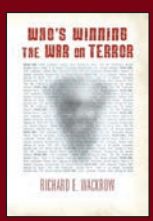


THE 7 LAWS OF MAGICAL THINKING: How Irrational Beliefs Keep Us Happy, Healthy, and Sane. Matthew Hutson. Most of us engage in magical thinking to some degree, even when we don't think so. Hutson, a former *Psychology Today* news editor, draws upon cognitive science to discuss seven such "laws": objects carry essences, symbols have power, actions have distant consequences, the mind knows no bounds, the soul lives on, the world is alive, and everything happens for a reason. Hudson Street Press/Penguin, 2012, 296 pp., $25.95.



THE SCIENCE OF YOGA: The Risks and the Rewards. William J. Broad. A veteran *New York Times* science journalist and longtime practitioner of yoga presents what he calls the first impartial evaluation of the thousand-year-old practice, celebrating what's real and uplifting and showing what's illusory, flaky, and dangerous, while offering a vision of how the practice can be improved. Simon & Schuster, 2012, 336 pp., $26.

STANDARDS: Recipes for Reality. Lawrence Busch. A fascinating sociocultural and scientific examination of standards: those necessary (and sometimes arbitrary) rules by which we measure the world, delineating what is acceptable from what is not. MIT Press, 2011, 296 pp., $35.



WHO'S WINNING THE WAR ON TERROR. Richard E. Wackrow. An insightful, skeptical analysis of the American "War on Terror" initiated after the September 11, 2001, attacks and its consequences, exposing exaggerated warnings, lies, and flawed assumptions in how the U.S. Government has responded "in the interest of national security." Empiricist Press, 2012, 233 pp., $29.95.

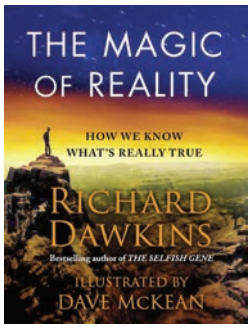
—Benjamin Radford and Kendrick Frazier

Answers for Kids from Twelve to Eighty-Two

KEITH TAYLOR

Richard Dawkins's books form a bulwark of science against the everlasting siege of credulous ideas fomented by religious leaders, talk-show bombasts, advertisers fudging on facts in order to justify the next quarter's bottom line, and politicians who promise to deliver what we, the electorate, choose to believe. Since his first book, *The Selfish Gene* (1976), Dawkins's popularity has grown among adult freethinkers. Now, with *The Magic of Reality: How We Know What's Really True,* he expands his focus to include "kids from twelve to one hundred." I guess that includes me, a wheezing octogenarian, and my brilliant pre-teen great-granddaughter in Arizona.

If you buy it, and I urge you to do so, skip Nook or Kindle and spring for the hardbound copy with sturdy lacquered paper. The illustrations by Dave McKean alone will justify the extra cost. Put it on a table in your living room where people can pick it up, leaf through it, and learn something new. There's a lot to ponder in a mere 270 pages.



The Magic of Reality: How We Know What's Really True

By Richard Dawkins. Free Press (Simon and Schuster), New York, 2011. ISBN 978-1-4391-9281-8. 270 pp. $29.99.

When you finish, give it to a kid and discuss it with her/him. I intend to do just that with the Arizona kid. It will introduce her to a world quite different from the one described in Sunday school.

It's fun to read, but it isn't just a fun book. While Dawkins doesn't give myths credence, he doesn't ignore them. Chapter after chapter begins with both an illustration of what people often chose to believe in the past and an explanation of why they likely believed it. Then he carefully takes us through the science that illuminates the topic.

The book couldn't come at a better time. Election year always brings a plethora of religious ideas touted to "put America back on the right track."

Oh sure, we have always been awash with credulous thinking. Now, thanks to the Internet, credulity and misinformation come at the speed of fiber optics. No longer do we have to depend on the local village idiot to keep us believing in the little green men with pointy heads; today that village idiot is probably a popular blogger.

No longer do we have to depend on the local village idiot to keep us believing in the little green men with pointy heads; today that village idiot is probably a popular blogger.

I was almost a witness to an invasion of little green men in 1950. I was a young sailor finishing up my first hitch at Bainbridge Island in Puget Sound when the story broke. Three or four (sometimes a dozen or so) flying saucers buzzed around Mount Rainier, just south of Seattle. I didn't see the first wave, but the visitations continued until other news moved them off the front page.

On the second or third day of the brouhaha, one of my shipmates pointed the saucers out. I saw nothing unusual at first. Then, after a lot of help from my shipmate, I could make them out but had a hard time distinguishing the flying saucers from the ever-changing shapes of the clouds. But they were real. Everybody said so, although nobody knew what they were. When I received my discharge and got back home again to Sevastopol, Indiana, I was the village expert on the phenomenon, which was sweeping the country.

Of course, seeing something that isn't there doesn't do much harm unless we go to war over it. We nearly did that several times during the Cold War, once when some NORAD operators mistook the moon rising for incoming missiles.

In chapter after chapter, Dawkins treats us to myths and specious thinking without soft-pedaling the message to placate religious beliefs. He compares the idea of a first man named Adam and the incidents in the Garden of Eden to the story of the Norse god, Odin, who created men out of tree stumps. Although one story is familiar to all English-speaking people and the other is largely relegated to the trash bin of old

myths, Dawkins doesn't even suggest one "might have a bit of truth to it." He does suggest that someone saw things he didn't understand and created a story to explain what it was. He writes:

> Why tree trunks, I wonder? Why not icicles or sand dunes? Isn't it fascinating to wonder who made such stories up, and why? Presumably the original inventors of all these myths knew they were fiction at the moment they made them up. Or do you think many different people came up with the different parts of the stories, at different times and in different places, and other people put them together, perhaps changing some of them, without realizing that the various bits were originally just made up?

Elie Shneour, a noted San Diego scientist and my very good friend, tells me, "It is very difficult to change people's opinions. Sometimes the best we can do is plant a seed of doubt." Richard Dawkins does that very well. He does concede he enjoys good stories; indeed, when asked by an interviewer to name his favorite myth, Dawkins named the book of Genesis.

The Magic of Reality continues with the scientific understanding of our origins. Dawkins suggests that we are descendents of fish, some 185 million generations ago! Thus he leads us through twelve chapters, each starting with a question such as "What is reality, What is magic?" "Are we alone?" "What is an earthquake?" and "Why do bad things happen?"

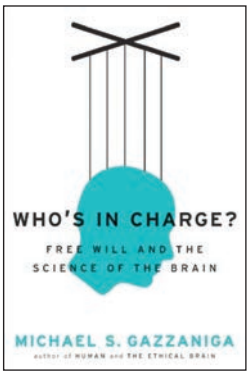
The reader will certainly not learn all the answers; Dawkins didn't. On page 180 he writes about how, with the big bang, time itself and space itself began: "Don't ask me to explain that, because, not being a cosmologist I don't understand it myself."

The reader, even a pre-teenager, will not learn all the answers either, but looking for answers beats believing in impossible things.

Keith Taylor is a retired Navy officer and the former president and program chair for the San Diego Association for Rational Inquiry. He can be reached at krtaylorxyz@aol.com.

Being Reasonable about Neuroscience

MASSIMO PIGLIUCCI



Who's in Charge? Free Will and the Science of the Brain. By Michael Gazzaniga. HarperCollins, New York, 2011. ISBN: 978-0061906107. 272 pp. Hardcover, $27.99.

These days it seems difficult to open a newspaper or listen to a podcast without hearing about the latest discovery concerning "the neuroscience of *X*," where *X* is anything from mystical experience to free will, from moral decision making to taste in wine. As fascinating as this type of research is, far too often we read largely unsubstantiated claims about neurobiology having "explained" *X*, with the implication that all there is to know about *X* is what neurobiology tells us.

For instance, Sam Harris, in his much celebrated *The Moral Landscape*, argues that neuroscience can answer moral questions, but at the same time he entirely avoids engaging with the hefty philosophical literature on ethics—particularly the is/ought gap, the idea that facts about the physical world do not automatically translate into moral judgments. Or consider the even more recent *The Atheist Guide to Reality*, in which Alex Rosenberg claims that "physical facts fix all the facts," a questionable starting point (2 + 2 = 4 is a fact, but it's not physical) from which the author derives a thorough and thoroughly bleak form of nihilism.

It is trivially true that if people engage in, say, moral reasoning, they *have* to do so by using certain parts of their brain rather than others. Everything we think and do has to imply a "neural correlate" of some sort. But to confuse this observation with the strong claim that therefore we have an "explanation" of what's going on is to seriously shortchange the meaning of explanation.

It is therefore most refreshing to read Michael Gazzaniga's latest book, *Who's in Charge? Free Will and the Science of the Brain*, on what neuroscience has to say about fundamental human behaviors, such as our ability to engage in deliberate decision making ("free will"). Gazzaniga certainly has the credentials for the job, having spent decades on the front lines of neurobiological research—particularly studying so-called split brain patients, individuals whose right and left cerebral hemispheres are disconnected, allowing scientists to peek at what the two regions are doing when they function in isolation. Gazzaniga is also well-read in philosophy, which is a must for a scientist venturing into territory where philosophers have treaded for centuries, and where there exists a sophisticated literature accompanied by its own technical jargon.

The surprise is that Gazzaniga is

much more cautious than other authors about the reliability and scope of brain scans and other techniques of modern neuroscience. He knows that scientists can measure brain activity only indirectly, that they can obtain largely correlational data, and that colorful (and impressive) brain scans are actually complex statistical compounds of a number of individuals, accompanied by various possibilities for error and over interpretation.

Gazzaniga doesn't buy the idea that there is no moral responsibility just because "the brain makes us do it," since moral responsibility emerges from the interaction of brains with particular social environments, the latter being the result of historical and cultural forces. The brain is certainly a crucial nexus, but "responsibility" isn't located anywhere within it. He also doesn't think that consciousness is an "illusion," a conclusion that, ironically, others derive in part from his own experiments on split-brain patients. Rather, consciousness emerges from a systemic dynamic network operating inside the intact brain, a network that we can partially disrupt and study under special circumstances, such as those offered by Gazzaniga's patients.

You may have noticed that I have used the word *emerge* more than once in describing Gazzaniga's take on things neuroscientific. Emergentism refers to one of two positions in philosophy of mind: on the one hand it encapsulates the (strong) claim that there are truly novel (i.e., irreducible to lower levels) properties of matter when certain conditions of complexity and organization apply. On the other hand it refers to the (weak) claim that some phenomena are so complex that our only hope at reasonable scientific descriptions rests on focusing on the proper level of analysis rather than attempting a reduction to the basic principles of physics, even if this were possible in theory.

I cannot tell from the book whether Gazzaniga is an ontological (strong) emergentist, but he is at the very least an epistemological (weak) one. Epistemological emergentism is rather uncontroversial, as it is true as a matter of pragmatism that we need different theories and concepts to understand different types of phenomena (try, for instance, to build a quantum mechanical model of the Brooklyn Bridge and see how far you get). Ontological emergentism—just like its chief rival, ontological reductionism—is a metaphysical thesis about which it is best to remain agnostic.

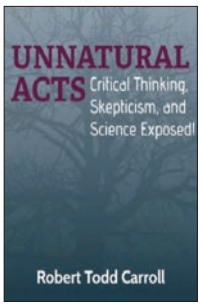
Who's in Charge is a must-read for anyone interested in the broader implications of modern neuroscience not wishing to fall for easy sensationalism or for philosophical claims masquerading as science. In the end, as Gazzaniga puts it: "We are people, not brains. . . .Go have a dry martini, put your feet up, and read a good book." A wise suggestion indeed. ■

Massimo Pigliucci is professor of philosophy at the Graduate Center of the City University of New York, a fellow of the American Association for the Advancement of Science, and author of *Nonsense on Stilts: How to Tell Science from Bunk*. His essays can be found at rationallyspeaking.org.

Thinking: An Unnatural Act

HARRIET HALL

Robert Todd Carroll, the author of the invaluable *Skeptic's Dictionary*, has written an e-book that makes a perfect complement to his *Dictionary*. Titled *Unnatural Acts: Critical Thinking, Skepticism, and Science Exposed!*, it is essentially a primer on how to think.



Unnatural Acts: Critical Thinking, Skepticism, and Science Exposed!
By Robert Todd Carroll. James Randi Educational Foundation, 2011. Available through Amazon.com and other electronic outlets exclusively in e-book format, $9.99.

The "unnatural acts" of the title are the acts of critical thinking, which don't come naturally to our imperfect human brains. Our brains evolved an instinctive, intuitive, quick-and-dirty way of thinking that served our forebears well in their environment. A slower, more systematic, more critical way of thinking developed later and brought us science. It serves us better in today's world but is more difficult to achieve. It requires education and concentrated effort to overcome the natural tendencies imposed on us by our evolutionary history.

The brain is an illusionist. It works by taking shortcuts, deceiving us into seeing things that aren't there and believing things that aren't true. We see the sun apparently moving across the sky, and it takes sophisticated understanding to overcome our first assumptions. Nature has programmed us to increase our chances of survival and reproduction, not to seek the truth. Religious literalists, New Age philosophers, and other true believers prefer magical thinking to science because we are hardwired to think that way. So creationism is often preferred over evolution, and fanciful medical quackeries

are often preferred over effective treatments proven by scientific studies.

Critical thinking is *hard*. We must learn that we can't trust our perceptions, memories, and intuitions. This requires education and practice. It's frustrating to accept that our most cherished beliefs might be wrong. And it's frustrating to know that success is elusive: the truths we learn will always be provisional, and we can never be certain whether we have looked at all the relevant data objectively.

In successive chapters, Carroll explains:

- Critical thinking is unpopular: you will lose friends and alienate your neighbors.
- Trust no one, not even yourself: you, too, are subject to perceptual distortions and cognitive biases.
- Language is often used to manipulate thought and behavior.
- Groupthink—communal reinforcement—seduces groups of people into bad decisions.
- It is becoming increasingly difficult to identify reliable information amid all the hype, propaganda, advertising, and misinformation.
- Anecdotes are compelling: a good story trumps a dozen scientific studies. Scientific studies are more reliable in the search for truth but are also subject to bias.
- Fallacies in reasoning are widespread and natural; man is an irrational animal.
- Natural factors conspire to lead us into error, but there is hope that we can learn to overcome our natural tendencies and become critical thinkers.

In the final chapter, Carroll provides practical advice: fifty-nine ways to develop your unnatural talents in critical thinking, skepticism, and science. This list will be enhanced by the blog *Unnatural Acts* (www.59ways.blogspot.com), where he will be offering commentary and examples of the fifty-nine ways (plus a few more). Five appendices round out the banquet with detailed discussions of cell phone radiation, interstellar travel, acupuncture, what it really means to think critically, and step-by-step instructions on how to create your own pseudoscience. Refreshingly, he admits to errors of his own in *The Skeptic's Dictionary* and corrects the record.

I laughed out loud at Carroll's account of his first attempt at teaching logic as a newly minted philosophy PhD. "If I remember correctly, about twenty-five students signed up for the class and three finished. One of the three stayed because he liked me. Another stayed because he didn't know how to drop a class. The remaining student understood the material in the text . . ." Over time, he progressed from teaching traditional logic to offering more useful courses in critical thinking as a way of life, emphasizing an understanding of the psychology of bias and other sources of error and embodying an attitude of intellectual humility, confidence in reason, intellectual curiosity, and intellectual independence.

Since critical thinking is important to every aspect of human life, he illustrates his points with examples drawn from every imaginable field: religions, UFO cults, psychology, alternative medicine, politics, parapsychology, martial arts, criminology, climate change, news media, vaccines, cell phone radiation, cancer clusters, and more.

Some of his examples will be familiar from other skeptical writings, like Clever Hans (the horse that responded to its owner's unconscious body language) and the basketball/gorilla video illustrating inattentional blindness. Others were new to me, like the example of audio pareidolia where a Bob Dylan song lyric is heard as "throw my chicken out the window."

There can never be too many books on critical thinking. Carroll's is a worthy contribution to the skeptical literature: comprehensive, easy to read, and packed with entertaining examples that vividly illustrate the concepts. For those new to skepticism, it can serve as a valuable textbook for learning how to think. It will be useful to even the most jaded skeptics among us who think we already know how to think; we all still make mistakes, we need to be reminded anew of old lessons, and there is always more to learn.

Harriet Hall, MD, also known as "The SkepDoc," is a retired family physician who writes about pseudoscience and questionable medical practices. She is a SKEPTICAL INQUIRER contributing editor and a contributor to the *Science-Based Medicine* blog.

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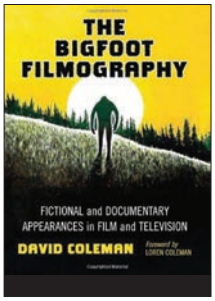
For more online columns, features, and special content, visit **www.csicop.org.**

Bigfoot on Film: A Comprehensive Guide

ROB BOSTON



The Bigfoot Filmography: Fictional and Documentary Appearances in Film and Television. By David Coleman. McFarland & Co., Jefferson, North Carolina, 2012. ISBN: 978-0-7864-4828-9. 338 pp. Softcover, $49.95.

There is probably no such thing as a sasquatch, but that doesn't mean we can't have fun pretending that there might be. These days, a lot of people are doing just that. Witness the tendency to employ the creature as a mascot for a variety of products that includes beef jerky, snack pastries, and sodas.

Alongside his career as a pitchmonster, sasquatch/Bigfoot/Yeti has enjoyed starring roles in numerous films. Mostly low-budget affairs, these movies include both fictitious tales of a blood-thirsty monster on the loose and pseudo-documentaries that purport to examine the possibility that such a creature exists.

Bigfoot hunters may not be successful in bagging the beast, but Coleman has doggedly tracked down perhaps every Bigfoot appearance on celluloid.

The importance of these films and television programs should not be overlooked. If you ask Bigfoot hunters what got them interested in the legendary man-beast, many will cite a film, perhaps 1972's *The Legend of Boggy Creek* or the 1976 "schlockumentary" *The Mysterious Monsters* (where the only thing scarier than the dramatic recreations of encounters with Bigfoot was the plaid sport coat worn by host Peter Graves).

Screenwriter David Coleman offers a comprehensive roundup of what he calls "Ciné du Sasquatch" in his excellent and entertaining new book, *The Bigfoot Filmography: Fictional and Documentary Appearances in Film and Television*. Coleman takes no position on the existence of the beast; that's not the point. Real or not, Bigfoot has captured the imagination of filmmakers and has earned a place in American popular culture. Bigfoot hunters may not be successful in bagging the beast, but Coleman has doggedly tracked down perhaps every Bigfoot appearance on celluloid, including big-studio films, indie efforts, shorts, television appearances, and even commercials.

The book, profusely illustrated with movie stills and poster art, is great for a quick dip or a page-by-page read. But it's not just fur and fun. Coleman opens the book with a highly erudite twenty-seven-page essay he titles "Ciné du Sasquatch as a Genre Convention." Coleman traces the evolution of the genre, citing *King Kong* and various "wild ape on the loose" movies as early influences. Abominable Snowman movies in the 1950s and 1960s inspired Bigfoot films in the 1970s, most of which were "beasts and breasts" fare for drive-ins. The 1980s saw the rise of direct-to-video bloodbaths, but the decade closed with *Harry and the Hendersons*, in which Bigfoot was a nonthreatening overstuffed teddy bear. The success of that film (and subsequent TV spin-off) led to a rash of Bigfoot kiddie flicks, in which the hominid is a gentle giant who helps little Jimmy have the best summer ever.

But few adults want to see a Bigfoot obsessed with peace, love, and understanding, so even though there are few alleged instances of Bigfoot getting violent on record, most films depict him as a killer—often without cause.

Coleman excels with the sheer amount of data he provides about these films. For each movie he provides a list of actors, a plot summary, and an often-meaty interpretive essay that gives information about the film's background and its (possible) larger significance.

Anyone who grew up watching a Saturday-night program with a name like "Chiller Theater" will find plenty to reminisce over while leafing through *The Bigfoot Filmography*. Horror film buffs might recall *Shriek of the Mutilated*, featuring a white, prancing Yeti who bizarrely resembled a bipedal dog, or *The Capture of Bigfoot*, a 1979 offering set in the wilds of Wisconsin involving a juvenile Bigfoot whose imprisonment enrages daddy Bigfoot. And who could forget Rives and Pahoo's epic showdown against a Louisiana "skunk ape" in 1976's *Creature from Black Lake*?

The rise of computer effects produced better-looking Bigfoot monsters in the 1990s and beyond, but alas, much Ciné du Sasquatch is still plagued by cheap monkey suits, flat scripts, and bad acting. It's to Coleman's credit that he sought out so much of this stuff. Anyone who sits through dogs like *Search for the Beast* and *Suburban Sasquatch* deserves our thanks.

Coleman is also good at uncovering the range of films within this genre. Readers will note that many of these movies feature randy sasquatches who are fond of abducting nubile maidens. Indeed, a few films rate as soft-core porn, and at least one, *Yeti: A Love Story*, is a

boy-meets-sasquatch gay romp with high camp value. But Ciné du Sasquatch offers comedy, "mockumentaries," family fare, and sci-fi as well.

It's clear Coleman has a fondness for Bigfoot flicks, but as a screenwriter he more importantly understands the power of the movies—or, more to the point, the power of stories. We can, and do, tell each other lots of stories. Why do we keep telling this one about the big, hairy man-ape in the woods?

While Bigfoot hunters continue what is probably a futile search, inquisitive skeptics are stepping up their game. They don't look for a flesh-and-blood creature; rather, they ask why we have became so enamored of a monster that always lurks beyond our subconscious, just out of reach in the dark and foreboding forests.

The Bigfoot Filmography provides one answer: Sometimes, it's fun to give ourselves a scare by imagining what might be out there behind the tree line—especially if those speculations take place from the safety of a couch bathed in the glow of a flickering TV screen.

Rob Boston is assistant editor of *Church & State*, published by Americans United for Separation of Church and State in Washington, DC. Email: boston@au.org.

INBOX]

NCCAM Grants: Measuring Mythology

Well, you've done it again—validated the reasoning to stay a CSICOP (I choose the euphonious name rather than the shorthand CSI) member all these years!

The cover article for January/February 2012, "Measuring Mythology: Startling Concepts in NCCAM Grants," elated me with its open, detail-stuffed exposé and, at the same time, saddened me with the evidence that too many people do not think rationally.

I've known that complementary medicine "treatments" are unproven fear-abatement attempts pressed upon the gullible by the gullible and nefarious, but I didn't dream that it is *that* pervasive.

I guess it's like that (in)famous curmudgeonly, acerbic wit Mark Twain is said to have said: "It ain't what you don't know that gets you into trouble, but what you know for sure that ain't so."

Philip Kuchuk
Hamden, Connecticut

I would like to add a statistical perspective to Eugenie Mielczarek and Brian Engler's review of NCCAM grants.

Fundamentally, studies of alternative health therapies make an inappropriate assumption of equipoise. Results are said to be statistically significant if they are positive at p=0.05, but scientific treatments are tested for human efficacy only after an arduous process in which biologic plausibility generates in-vitro experiments, in-vivo animal studies, and human dose-ranging and toxicity work. For ethical drugs the pretest probability of utility is quite high before any phase III studies are done. Treatments with their rationale based on pre-Columbian usage or current popularity have a far lower pretest probability. For therapies, such as homeopathy or prayer-at-a-distance, that violate basic laws of chemistry and physics the probability approaches zero. Simple Bayesian statistics shows that interventions with a low pretest probability are still likely to be useless after a positive test result. Using standard statistical criteria for deciding clinical usefulness is grossly inappropriate when analyzing alternative remedies.

These studies are unethical because patients are subject to risk of harm without significant chances for benefit; any effective treatment changes some physiological processes and could cause harm.

How NCCAM has managed to avoid meeting these elementary scientific and ethical requirements is a bit of a mystery. That behavior would not be acceptable at any of the other NIH Centers.

Mark Hauswald
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HPV Controversy | Medicines from Herbs | Inside Scientology | Hume vs. Rosseau | The Holy Mandylion
Skeptical Inquirer
THE MAGAZINE FOR SCIENCE AND REASON
MEASURING MYTHOLOGY
Startling Concepts in NCCAM Grants
Fabricating History, Part Three: Real Messages in DNA
Humor in Paranormal Discourse
Testing Power Balance Bracelets
Mysterious Meteorite of Chalk Mountain
Information Literacy and Conspiracy Theories

I found "Measuring Mythologies: Startling Concepts in NCCAM Grants" a generally well-written and long-overdue exposé of the National Center for Alternative and Complementary Medicine. I do, however, take exception for the inclusion of the SELECT study of the effects of selenium and vitamin E on preventing, not treating, prostate cancer. The program offered frequent free screening tests in addition to a double-blinded test of dietary supplements (pills) containing se-

lenomethionine and/or vitamin E or neither. Although vitamin E and selenium supplements do not lower the incidence of prostate cancer, the long-term study continues.

John H. Chalmers
Rancho Santa Fe, California

Eugenie Mielczarek and Brian Engler's picture of fraud and waste for complementary and alternative medicine (CAM) in NCCAM grants should be viewed in perspective.

The annual NIH grant portfolio is $31.2 billion. The CAM portion of NIH is $531 million—about 1.7 percent. NCCAM's budget is $127 million. Total U.S. healthcare spending is more than $2.5 trillion, of which between 20 percent and 30 percent is wasted according to Dr. Berwick, departing head of Medicare and Medicaid. National consumer spending on CAM was $33.9 billion (2007 survey—1.4 percent of total healthcare spending). Some 50.7 million people in the United States do not have health insurance. When compared to Britain, Canada, Germany, the Netherlands, Australia, and New Zealand, the Commonwealth Fund report found the U.S. ranked dead last in quality of health care.

In perspective, CAM spending and impact is pretty small. CAM is folk medicine, which fills a gap when people lack access to or are failed by conventional medicine. If mainstream medicine were available to all and treated patients like customers, CAM might fade away. Until then this country cousin has a small willing market and, strangely enough, often works.

Robert D. Veitch
Minneapolis, Minnesota

Eugenie V. Mielczarek and Brian D. Engler reply:

We thank Messrs. Kuchuck, Hauswald, Chalmers, and Veitch for their interest in our study.

Regarding Mr. Chalmers's comment: The authors stand by their inclusion of the SELECT study in the article. While screening of study participants continues as a follow-up, the use of the supplements by clinical trial participants was terminated by a safety panel in 2008. Indeed, subsequent to writing our article a paper was published stating that "the Data and Safety Monitoring Committee has found that participants who took the study supplements of vitamin E (400 IU per day) and a placebo for selenium have a 17% higher risk of prostate cancer than those who took two placebos" (http://select.crab.org/).

Mr. Veitch's conclusion that CAM should be supported by federal funding because it might work is what we tested by studying all the grants from NCCAM for the last ten years. Our conclusion that NCCAM should be defunded was based on the lack of evidence of any successes for medical uses of CAM. A willing market is the hallmark that fosters belief in these cultural mythologies. Promotion of unproven CAM therapies prevents needed medical care from reaching the poor and uneducated, some of whom, desperately ill and mythologically persuaded by marketing, delay appropriate care until it's too late.

There are significant factual errors in the article by Eugenie Mielczarek and Brian Engler in the January/February issue of the SKEPTICAL INQUIRER. The article erroneously states that the American Physical Society (APS) Division of Biological Physics (DBIO) has endorsed a statement on distance healing. This is completely incorrect—DBIO has not endorsed such a statement. Furthermore, while a draft statement is currently under consideration, it does not include the sentences quoted by Mielczarek and Engler in their article.

Mark Reeves, APS Councillor for DBIO
Lawrence Krauss, former chair, Physics and the Public Subcommittee, APS POPA

The authors reply to Mark Reeves and Lawrence Krauss:

The American Physical Society has expressed concerns that our article implies that the American Physical Society and/or the Division of Biological Physics has "endorsed" an official "statement" on energy healing protocols. Our use of the word statement *was in the colloquial sense as it was used by the Division's subcommittee in its deliberations and edits of its wording. We advise the reader that no inference should be made as to the endorsement or publication of an official position "statement" by the Division or the Society.*

In the interest of full transparency: On October 1, 2010, the Division of Biological Physics presented before the Panel of Public Affairs (POPA) of the American Physical Society a motion from its subcommittee. On October 21 an edited version** of its motion was sent from the POPA to the Executive Council of the American Physical Society for review. This matter is under consideration by the Executive Council of the American Physical Society.*

The members of the Division subcommittee, charged with bringing this motion before The Panel of Public Affairs of the American Physical Society, were Eugenie Mielczarek, Chair of Subcommittee; Jose Onuchic; Robert Knox; Mark Reeves; Steven M. Block; and Herb Levine, Chair of Division of Biological Physics. The subcommittee was required by APS to include how the statement should be used *before it could be considered as a motion from the division before POPA. All public "statements" are available on the website of the Society. Minutes of POPA meetings are available on its website.*

**Request: addition to the agenda for the October 1 meeting of the Panel On Public Affairs APS: a consideration of the following statement passed by the executive council of DBP needed as an educational outreach for the public understanding of science at the frontier of physics and biology.*

Practitioners of several types of Alternative Medicine such as Therapeutic Touch have argued that human beings can affect biological processes at a distance via the creation of "healing energy", thereby positively impacting patient health. The Biological Physics division of the APS has ascertained that there is no known biophysical mechanism that could reasonably support such effects and that the "energy" being referred to cannot be connected to the precise notion of energy as it [is] used in physical science. Specific claims that humans can generate biomagnetic fields at the milligauss level are not credible, as typical measurements determine this field strength to be three orders of magnitude lower. Similarly, there are no known mechanisms whereby a typical cell or its components could respond reliably to a human-generated electromagnetic field at the distances in question, in the presence of thermal fluctuations of much higher magnitude. Appeals to a more general "human biofield" which is not connected to known phenomena and cannot be directly measured are inherently nonscientific. Because of its lack of any basis in our current physical understanding, we are skeptical of published claims that Therapeutic Touch can give rise to statistically significant modifications of biological behavior. In accordance with APS's Web posted "Internal Policy subsection 'POLICY ON STATEMENTS BY APS UNITS,' the Division requests that this statement be recorded as coming from the Division of Biological Physics, in the Washington Office of APS and made available to all who request it.

***Practitioners of several types of alternative medicine have argued that human beings can affect biological processes at a distance via the creation of "healing energy" to improve patient health. There is no known biophysical mechanism that could support such effects, and the "energy" being referred to cannot be connected to the concept of energy as it is used in the physical sciences. Specific claims that human beings can generate magnetic fields at the milligauss level are not credible. Typical measurements of these fields have shown them to be a thousand times smaller, much smaller, in fact, than the magnetic fields generated by thermal fluctuations. There are no mechanisms for a typical cell or its components to respond to the fields created by hypothesized healing energy.*

Thank you for your inquiry on this

important matter of scientific integrity.

Eugenie V. Mielczarek
Chair of the Subcommittee of the Division of Biological Physics charged with bringing this matter to POPA

Brian D. Engler

Finding What's Funny

I quite enjoyed Jonathan C. Smith's informative article, "Laughing Goats and Scowling Sheep: Humor in Paranormal Discourse" (SI, January/February 2012). As a member of the three-time Grammy-nominated Firesign Theatre comedy group, I've utilized similar techniques for over forty-five years, surrealistically influencing the comedic work of many, including friends like the formidable Penn and Teller and the late, great George Carlin.

The best example of this approach can be observed in *Everything You Know Is Wrong,* released as a record and short film in 1974. In it we investigate the popular pseudoscientific beliefs of the time, many of which persist today, in the context of a serious documentary produced by "Happy" Harry Cox from his Nude Age Enterprises trailer studio in Hellmouth, California.

Topics include "Dogs Flew Spaceships," "The Aztecs Created the Vacation," "Our Forefathers Took Drugs," "Men and Women Are the Same Sex," and "Your Brain Is Not the Boss," an Air Force film on how to deal with an alien invasion. We also feature sequences with Nino the Mind Bender, Shaman Don Bruhaha, and Buzz and Bunny Crumbhunger, who show home movies of their alien abduction (and Buzz's subsequent pregnancy).

Access it at www.firesignthe atre.com or on YouTube if you're interested in satire and parody as a debunking technique. And remember, "There's a seeker born every minute!"

Phil Proctor
philip.proctor@mac.com

Satan's view on the power of humor, as told to a human companion and revealed by Mark Twain:

> For your race, in its poverty, has unquestionably one really effective weapon—laughter. Power, money, persuasion, supplication, persecution—these can lift at a colossal humbug—push it a little—weaken it a little, century by century; but only laughter can blow it to rags and atoms at a blast. Against the assault of laughter nothing can stand.

Ken Anderson
me.xiken2@live.com

Jonathan C. Smith's article on humour (as we spell it in Britain!) in paranormal discourse is excellent, but he is in error in saying that the director of the McDonnell Laboratory for Psychical Research was James McDonnell.

McDonnell was the founder of the McDonnell Aircraft Corporation, which merged with Douglas in 1967 to become McDonnell Douglas (which was itself taken over by Boeing in 1997). Despite McDonnell's success in a very concrete technological field, he was a believer in the paranormal, especially the survival of bodily death. In 1979 he gave $500,000 to Washington University in St. Louis to found what became known as MacLab to investigate claimed paranormal powers, and it was this laboratory that was the victim of James Randi's brilliant Project Alpha hoax. However, the laboratory director was a physicist, Peter Phillips, not McDonnell himself (who in any case died in 1980).

Ray Ward
London, England

Smith's whimsical article, "Laughing Goats and Scowling Sheep," makes some good points, especially if one's aim is to engage in dialogue rather than simply criticize.

I sincerely hope no one misunderstands his reference to the "traditional Biblical (Matthew 25:31–46) groupings of sheep (blessed believers) and goats (condemned skeptics)." Smith, though presumably well-intentioned, has made up the parenthetical application and quite warped the original point in the process. As even a quick glance at the passage in question will reveal, it is not about believers and skeptics but about those who care for their fellow human beings and those who ignore them. The blessed are those who have made efforts to improve life for all. The condemned are the proud, selfish, and indifferent.

From my perspective, believers and skeptics should join in efforts to feed the hungry, comfort the distressed, and make the world a better place. I can only hope that the followers of the Invisible Pink Unicorn feel the same way.

Ralph A. Marino
Valley Falls, New York

Jonathan C. Smith replies:

I remember enjoying and eagerly anticipating Firesign Theatre recordings four decades ago. I've never recovered. Thanks, Phil (check out my "Pastafarian Quatrains").

I thank Ralph Marino for his kind and thoughtful comment. However, let me note that I did not create the "parenthetical application" of "goats and sheep." This was invented in 1942 by Gertude Schmeidler, professor of psychology at the City University of New York. She used the term sheep *to refer to paranormal believers and* goats *for disbelievers. Perhaps she was unaware of the biblical source of the metaphor (readers, please let me know otherwise). In the Bible, goats and sheep are hardly neutral creatures. Goats receive scorn whereas sheep are blessed (after all Jesus was described as a "shepherd"). In my piece I simply pointed out this Bible-based bias applied to barnyard animals and subtly suggested that this reflects the scorn many believers have toward skeptics. Obviously, nowhere do I claim that the Bible is referring to believers, skeptics, James Randi, or the Flying Spaghetti Monster. Indeed, the Bible has precious little to say about questioning and objective, dispassionate, skeptical analysis as a path to "truth"; it is very much the holy book of blind belief and obedience. But that's another point.*

Information Illiteracy

Relating to Kristin E. Harley's article, "Information Literacy and Conspiracy Theories" (SI, January/February 2012), I would like to comment on the loss of the analog video data containing Neil Armstrong's first steps on the Moon. Stanley Lebar, the Westinghouse Program manager for the Apollo Lunar TV Program, searched for those magnetic tapes for several years. The video data was mixed with the normal telemetry data when transmitted from the Moon and was received by the NASA station in Australia. It was then relayed to NASA at Goddard. The video data was copied from the telemetry data in Australia, to be fed to the TV networks. The camera frame rate was 10 frames per second, so it had to be converted to the 30 frame/second interlaced format used in the United States.

Stanley Lebar left no stone unturned in his search, which involved NASA at Goddard, NASA at Houston, the National Air and Space Museum, and the National Archives. He found that several boxes of tapes in the National Archives system most likely had contained the tapes with the video, but they had been returned to NASA Goddard. In the meantime, budget shortages resulted in reusing magnetic tapes for later projects. The most probable cause for the loss of tapes was that they were among those that were overwritten to support later projects.

If the original data could be retrieved, they were to be processed with modern technology, which would eliminate the ghostly shadows and poor images for preservation of history. This was not in response to conspiracy theories; the legacy of a much higher-quality video

would have been great for historical records.

One of the surviving cameras is at the National Electronic Museum (www.nationalelectronicsmuseum.org). The camera was successfully operated a few years ago for a celebration honoring the engineers that developed it.

Ralph Strong
Retired, Westinghouse, Project Manager
Volunteer, National Electronic Museum

Fabricating History

I have just become aware of your series of articles on "Civilizations Lost and Found." I would like to congratulate you re: Part Two (November/December 2011), a worthy summary of the problems of provenance, historical fact, and objective evidence, which the examples you cover have demonstrated.

I would, however, like to make two points:

1. I think you should be more explicit in your "disclaimer"; to put the matter more bluntly, I think you should state outright that the journal *Ancient American* (and its editor, Wayne May) are fundamentalist Mormons, thus dedicated to trying to prove that the Book of Mormon and associated texts are true with respect to the origins of Native Americans, African Americans, etc. (despite the DNA and material evidence that overwhelmingly demonstrate the falsity of Mormon claims). I think your readers should be apprised of this, and you should not hide behind your bland "disclaimer."

2. My one caveat is your tendency to treat all those who either suspect or maintain the existence of pre-Columbian contacts as "diffusionists"—all equally irrational, etc. This unfortunate generalization would include the Viking presence at L'Anse aux Meadows, a clear example of a pre-Columbian presence in North America, and any other possible future examples, which should not be excluded a priori. (Personally, I think there may well have been other trans-Atlantic connections; if the Vikings could manage it, why not others?)

M.W. Wenner
Prescott, Arizona

The article series "Civilizations Lost and Found: Fabricating History" did a good job assessing the claims of the *Lost Civilizations of North America* documentary and its claim that there was a pre-Columbian migration of Israelites to the Americas.

Why is it that so much pseudo-history is obsessed with the ancient Israelites? Attempts to prove that present-day populations, often in unlikely locations, are descended from this group of people still occurs.

The classic example is British Israel theory. In the United Kingdom groups like the British Israel World Federation promote the claim that the present-day inhabitants of Britain are the descendants of the "lost" ten tribes of northern Israel. The belief that Anglo-Saxon and Celtic (i.e., "white") nations share a common heritage with the Jewish tribes of the Old Testament peaked in Britain in the 1920s at the height of the British Empire. That such ideas continue today is worrisome.

Well done for publishing in-depth articles that deal with such historical topics.

Graeme Kemp
Wellington, Shropshire
United Kingdom

Kenneth L. Feder, Bradley T. Lepper, Terry A. Barnhart, and Deborah A. Bolnick reply:

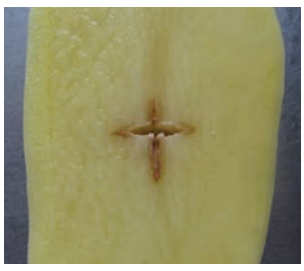
In response to M.W. Wenner: Concerning the Mormon affiliation of some of those interviewed by the producers of the Lost Civilizations of North America *documentary, we intentionally crafted our analysis of the diffusionist claims made in the video to tightly focus on the claims themselves and not the religious perspectives of the individuals making the claims. The "history" presented in the documentary is plainly false, regardless of whether that history was informed by religious doctrine.*

Wenner also makes the valid point that not all claims of pre-Columbian contact between the Old and New World are "equally irrational," specifically citing the case of the Norse. We agree. In fact, in the second article (November/December 2011, pp. 53–54) we discussed the clear archaeological evidence for a Norse presence in northeastern Canada and used it as a model for the kinds of material evidence that must be found—and has, to date, not been found—before archaeologists accept claims of other ancient New World visitors.

Potato for Christ?

Massimo Polidoro provides a rational explanation of a "strange" phenomenon a woman found in her potato slice in his article "The Case of a Weeping Orthodox Icon" (SI, January/February 2012). A couple of years ago, I took a photo of a similar potato I grew in my garden.

However, because I studied plant pathology nearly fifty years ago, I did not find it strange. Instead I wondered what the reaction might have been if this had been found in Ireland.



It is, after all, a fair facsimile of a Christian symbol.

Jim Ring
Tahunanui, Nelson
New Zealand

What's Human? What's Behaviorism?

In his review of *The Most Human Human* ("Turing Test for Human Beings," SI, January/February 2012), Massimo Pigliucci maintains that computers lack "'understanding,' let alone consciousness," and that a program like Deep Blue, which defeated the world chess champion, "wasn't thinking in anything like the way a human being does."

Pigliucci is undoubtedly right, and we will never attribute understanding, let alone consciousness, to anything made out of metal instead of meat. This is an observation only about our use of language, however, and tells us nothing about computers. The interesting question is whether there is a fundamental limitation that forever prevents computers from doing some tasks that human beings can do.

We will never have a definitive answer to this question, but on all available evidence, the answer is no. In 1978 Hubert Dreyfus predicted, on fundamental philosophical grounds, that computers would never play master-level chess. Since then, critics of artificial intelligence have been careful to concentrate not on what computers can do, which would be discredited "behaviorism," but on what they are, which is, well, not human.

Some tasks, of course, are quite beyond what computers can currently do. Even here, however, there are surprises. Even an enthusiast like me would have said two years ago that a computer winning on *Jeopardy* was decades away.

Charles Haspel
Miami Beach, Florida

Professor Pigliucci has the motto "Ignorance, the root and stem of all evil" posted at the head of his website, but apparently he still prefers to remain ignorant about contemporary behaviorism; at least, that is my conclusion after reading his review of *The Most Human Human* by Brian Christian. His comments on behaviorism suggest a second- or even thirdhand knowledge of the field. In "Skepticism of Caricatures: B.F. Skinner Turns 100" (SI, Jan-

uary/February 2004), Scott T. Gaynor presented and thoroughly refuted three myths about Skinner's variety of behaviorism: the Blank Slate Myth, the Empty Organism Myth, and the Only Overt Behavior Myth. Unfortunately, Pigliucci seems not to have read this article, although he was a contributor to the same issue. If he had, it should have dispelled him of the Only Overt Behavior Myth, which he still seems to hold so dear.

Pigliucci also has a rather skewed understanding of what gave rise to the behaviorist movement. He thinks it was a reaction to psychoanalysis. A reading of the seminal works of J.B. Watson and B.F. Skinner will reveal how totally out in left field this interpretation is. Freud and psychoanalysis are barely mentioned by Watson and Skinner in passing.

Pigliucci seems to think behaviorism as a psychological theory has gone extinct. While it is certainly true that you won't hear much mentioned about it in cognitive psychology circles (or should I say buildings) except perhaps in the same way that Professor Pigliucci does—derogatorily—it would be closer to the truth to say that the experimental analysis of behavior continues to be an active research field with well-established empirically based principles that continue to extend their reach into linguistic and cognitive domains. It also informs much of the activity being carried out by clinical practitioners. If these principles were not solid, the successes the practitioners have had and continue to have would not have been possible, making behavioral theory not only explanatory but also efficacious.

Raymond S. Weitzman, PhD
Professor Emeritus
California State University, Fresno

Massimo Pigliucci replies:

Charles Haspel correctly points out that the real question concerning artificial intelligence is whether there is some fundamental reason why computers will never achieve anything like human-type intelligence. The jury, as he says, is still out and will remain there for a while. However, it is fair to say that the strong AI program has largely been a failure in that respect over the past few decades, Big Blue and Watson notwithstanding.

It is increasingly clear that human intelligence isn't a matter of simple computational power or memory storage—since in both of these areas computers have already surpassed what a human being can do, yet they don't show any sign of consciousness. I suspect that consciousness requires more than computation, and indeed requires more than just brains. I am most certainly not advocating any form of mystical dualism, only suggesting that perhaps we ought to take seriously the fact that consciousness is a biological trait and that the processes that make it possible may be bound up in the specifics of the biology of organisms, not just the result of logical symbol manipulation (which is all computers do).

Professor Weitzman chastises me for not knowing enough about behaviorism, and I am certainly no expert in that area. However, recent attempts at reinterpreting what behaviorists were trying to do always remind me of what Alan Sokal wrote about postmodernism: "One often finds radical-sounding assertions whose meaning is ambiguous and that can be given two alternative readings: one as interesting, radical, and grossly false; the other as boring and trivially true." Either Skinner and Watson proposed a radically new approach to psychology, which ended up not working, or they simply tweaked commonsensical scientific methods that are hard to distinguish from what others have been doing. Which one is it?

As for the connection with psychoanalysis, all I suggested was that Skinner and Watson, among others, were reacting to the fuzziness and clear lack of scientific rigor in psychology of the decades preceding them, which were largely dominated by psychoanalysis. Ironically, this was actually the most positive aspect of behaviorism, in my opinion.

Finally, of course modern practitioners study behavior experimentally, but "behaviorism" refers to a specific theoretical and empirical approach in psychology, not just to the empirical study of behavior. To characterize much that currently goes on in psychology's daily practice, and especially in research, as behaviorism is to play on the ambiguity of the term.

Medicines from Herbs

The article on herbal medicines ("Medicines Derived from Herbs," SI, January/February 2012) got me thinking about the way we use and sometimes abuse words. *Drug*, for example, is a highly charged word that conjures up images of illegal or tightly controlled substances, often with dangerous or unknown side effects. Officially, medicines made from artificially synthesized substances are classified as drugs. Herbal or "natural" medicines are not. This distinction allows the sellers of natural remedies to market their products as "drug-free" or "not a drug." They do this to imply safety and the absence of side effects. But for a substance to really treat or cure an illness, it must bring about a physiological change in the human body, and isn't that the common definition of the word *drug*? To me, this seems like the kind of deception that George Orwell wrote about: manipulating public perceptions by redefining words.

Fred Filbrich
Rochester, New York

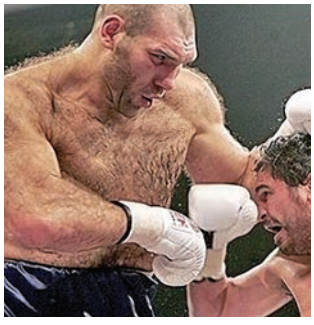
Edzard Ernst replies:

It is true that the term drug *is being used in several ways. For scientists, it usually means a pharmacologically active therapeutic agent. If we apply this definition, we see that some herbal medicines deserve the name, while many other herb-derived remedies do not. We also realize that "pharmacologically active" means the drug can cause harm.*

A Russian Yeti?

I was smiling softly while reading Benjamin Radford's news article, "Russians Confirm Existence of Yeti—But for How Long?" (SI, January/February 2012), when I came to the sentence "In fact, the event seemed more of a media circus than a scientific expedition when former Russian heavyweight boxer Nikolai Valuev recently toured the cave 'searching' for the Yeti, to great media attention."

Here is a picture of Nikolai Valuev, who stands 7'2" and weighs 320 lbs.



And they say that Russians have no sense of humor.

Alan Dean Foster
Prescott, Arizona

[FEEDBACK

The letters column is a forum on matters raised in previous issues. **Letters should be no longer than 225 words.** Due to the volume of letters we receive, not all can be published. Send letters as email text (not attachments) to letters@csicop.org. In the subject line, provide your surname and informative identification, e.g.: "Smith Letter on Jones evolution article." Include your name and address at the end of the letter. You may also mail your letter to the editor to 944 Deer Dr. NE, Albuquerque, NM 87122, or fax it to 505-828-2080.

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[THE LAST LAUGH BENJAMIN RADFORD

SKEPTICAL ANNIVERSARIES

by Tim Farley

May 17: In 1967, Tennessee repealed the Butler Act, under which John Scopes had been prosecuted for teaching evolution in 1925.

May 23 and 26: In 1922, Arthur Conan Doyle spoke in Chicago on Spiritualism; years later in an interview, J.B. Rhine said attending these talks inspired his involvement in parapsychology.

May 26: In 1992, Sylvia Browne was indicted in a criminal complaint over an investment scheme, leading to her felony conviction.

June 16, 23, and 30: In 1962, Rachel Carson's controversial environmental book *Silent Spring* was first serialized in *The New Yorker.*

June 19: In 1987, the U.S. Supreme Court ruled in *Edward v. Aguillard* that states cannot require the teaching of creationism in public schools.

June 24: In 1947, pilot Kenneth Arnold's seminal UFO report leads to the coining of the term *flying saucer* (by a misquoting newspaper reporter), influencing decades of UFO reports.

Tim Farley is a research fellow with the James Randi Educational Foundation and created the website whatstheharm.net.

Hidden Messages Puzzle Contest

Submit your solution by email to bradford@centerforinquiry.net or via postal mail to: Benjamin Radford The Last Laugh P.O. Box 3016 Corrales, NM 87048
Winner will be chosen at random from the first three correct submissions received by both email and postal mail.

March/April 2012 Hidden Messages Puzzle Contest Winner: **Adam Spontarelli**
This issue's prize: A one-year subscription (or extension) to Skeptical Inquirer.

HIDDEN MESSAGES by Dave Thomas

The following letters are a simple substitution cipher. If R stands for L, it will do so everywhere. Solution is by trial and error. Hint: Look for patterns in words; for example, the scrambled phrase "JRXJ JRQ" might represent "THAT THE."

PUZZLE

"ISG IXLOGRZ JE ISLI GPGXZ UXLJD KGMM RGPYIGR IY UGMJGW JD ISG ECHGXDLICXLM JE L UXLJD KGMM YDG KLDDYI CEG IY TLFG MJWG XJKSGX YX GLEJGX YX SLHHJGX."

—FLZ DYMIG ETJIS

CLUE: O = G

ANSWER KEY

As you decipher letters, keep track of them with the handy answer key below. If you've decided that R stands for L, simply write down an "L" above or below the "R" in the alphabetized row below, just as you would for the cipher itself. This builds a handy, easy-to-use reference guide for you and will also reveal the "Super Secret Word," a puzzle within a puzzle!

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

PREVIOUS PUZZLE SOLUTION: ***"IT IS THE TENSION BETWEEN CREATIVITY AND SKEPTICISM THAT HAS PRODUCED THE STUNNING AND UNEXPECTED FINDINGS OF SCIENCE."*** **— CARL SAGAN**

SUPER-SECRET WORD: AMBIDEXTROUSLY
(Instructions: www.nmsr.org/secretword.htm)

GET FUZZY BY DARBY CONLEY

GUYS, THIS IS MYSTIC MISTY. SHE'S HERE TO FIND THE SPIRITS THAT SATCHEL SENSES.
YOU SAID YOU DIDN'T BELIEVE ME ABOUT THAT.
NO. I SAID YOU WEREN'T GONNA FIND THEM WITH YOUR LITTLE VOICE RECORDERS. MISTY WILL FIND THEM, THOUGH, SHE'S A PSYCHIC MEDIUM.
COULDN'T YOU AFFORD A PSYCHIC LARGE?
HA HA!
I SENSE THE PRESENCE OF ONE WHO DOUBTS MY GIFT.
WELL, THERE'S ME EMBARRASSED. HER SENSE OF PERCEPTION IS TRULY EERIE.
darby

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